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Medical Quarterly

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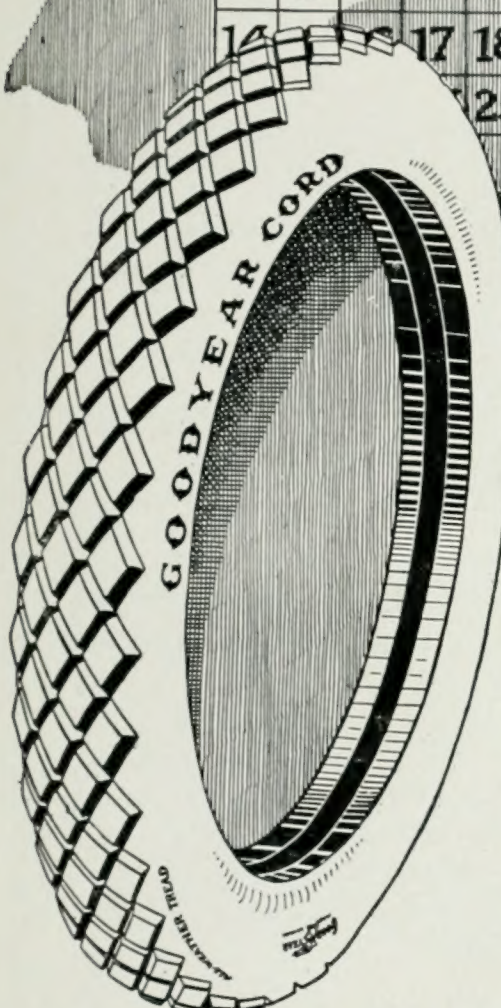
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VOLUME II

DECEMBER, 1919

NUMBER 2

CONTENTS

EDITORIAL—

PAGE

Annual Meeting, Ontario Medical Association	417
Education Among New Canadians	418
Dr. Murdock Chisholm	419
The Journal Becomes a Monthly	419

BIOGRAPHICAL—

Sir James Paget as a Student	420
<i>M. Charlton</i>	

1. Dysmenorrhœa	424
<i>W. W. Chipman, M.D., F.R.C.S., Edin., F.A.C.S., LL.D.</i>	
2. Cancer of Rectum and Pelvic Colon	433
<i>Neil J. Maclean, M.D., M.R.C.S., F.A.C.S.</i>	
3. The Nutrition of the Fetus	447
<i>J. Morris Slemons, Professor, Yale University</i>	
4. Pneumonia at the Base Hospital	462
<i>H. I. Kinsey, M.B., Captain, C.A.M.C.</i>	
5. Annual Address of President, Ontario Medical Association	469
<i>J. Stewart Cameron, M.D.</i>	
6. Current Medical Literature	481

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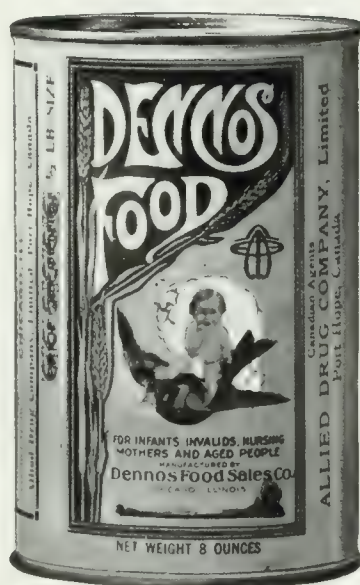
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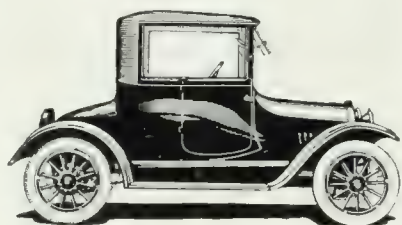


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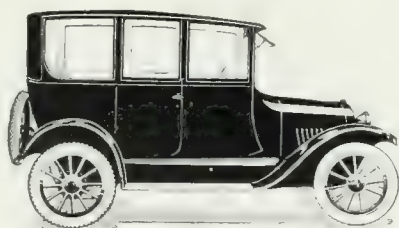
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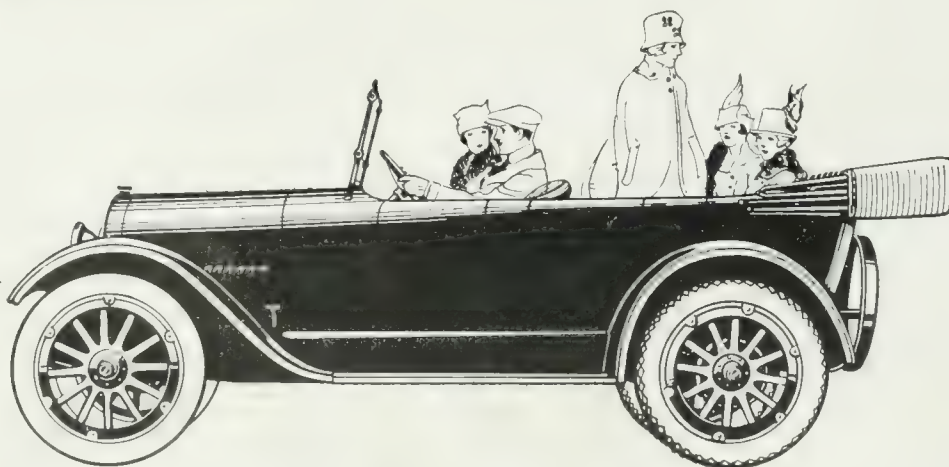
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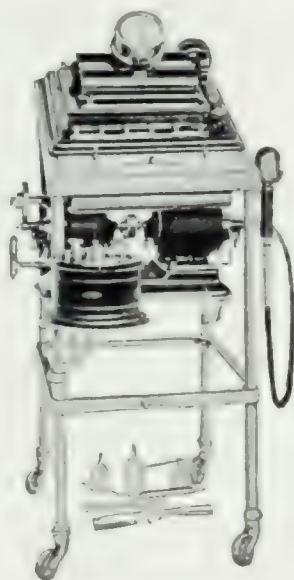


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The Canadian Medical Quarterly

VOL. II, No. 2

TORONTO, CANADA

DECEMBER, 1919

EDITORIAL

ANNUAL MEETING ONTARIO MEDICAL ASSOCIATION

It has been decided by the Executive Committee of the Ontario Medical Association that the next annual meeting shall take place in Toronto in May, 1920. With the war over and the medical profession more or less adjusted, prospects for a very successful meeting in Toronto next year are at this date quite bright.

Under the guidance of Dr. F. W. Marlow as President, and many strong committees which are now being appointed, every effort is being put forth to present a programme which will be of particular interest to all physicians attending.

The medical profession in Ontario will be interested to know that plans are already under consideration for the creation of a Medical Bureau in the office of the Secretary, which will supply leading members of the profession to address local and county society meetings desiring the services of these men. Working in conjunction with the various Universities and the profession at large, the committee which has this matter in charge hopes shortly to have in operation a plan which will thus appeal very strongly to the many districts throughout the Province. It is earnestly hoped that the various local organizations will avail themselves of the services which are being offered.

It was also decided that synopses of the points of interest discussed by the Executive Committee at the various sessions should be published in the medical journals, thereby keeping the profession informed of the activities of the Association throughout the year.

EDUCATION AMONG NEW CANADIANS

Reading a recent report issued by the Department of Education of Manitoba, one cannot help congratulating the Department, the officials and the teachers on the magnificent work which has been done and is steadily progressing in Manitoba by the school system of that Province.

The Western Provinces of Canada, particularly Manitoba, Saskatchewan and Alberta, are confronted with the stupendous educational problem of Canadianizing thousands of people of foreign tongue who are making Canada their home. No more striking example of "A little child shall lead them" can be found than that manifested in Manitoba, where, through the children, the adult population is being forced to recognize the manifold advantages of our civilization demonstrated in the rural schools of the province.

But to go back to the beginning, one must appreciate the system which trains and sends out to these people teachers of the sterling qualities of Miss Hambly, Miss Halstead and Mr. Inglott. The reports of the work which has been done by these teachers is a glowing tribute, not only to their qualifications, but to their heartfelt interest in a work which must benefit mankind to the end of time. We read of the opening of a new school in a foreign district in which the teacher is a most unwelcome guest. The "raw material" (bold yet elucidative description) on which she commences her work usually comprises anything from six to forty pupils, ranging in ages from five to twenty, unkempt, untutored, not only non-English speaking, but Pentecostal in their many tongues, full of foreign mannerisms, stoical, suspicious and non-comprehensive. But the story reads like the unfolding of the water lily from a slimy, unattractive bulb. In a few short months, in many cases, we find these same children evincing keen interest and zeal in their work. With their appetites once whetted, they display the greatest eagerness to learn not only the English language, but everything which conduces to cultured citizenship. Unique indeed are many of the methods employed in bringing about this mental unfolding—the flag, the gramophone, the sewing machine, community gatherings, sanitation, the example of the teacher's home—all have their important roles to play, each in turn awakening some vibrant chord which ultimately produces intelligent, bright, useful boys and girls, while awakening many of the finer traits of personality and citizenship in the hearts of the parents.

Under the guiding hand of the Hon. Dr. R. S. Thornton, Minister of Education for Manitoba, this splendid work, which is deserving of the highest praise and commendation, is being carried on.

The Province in particular, and the Dominion as a whole, will ever increasingly be the better for such well directed and wisely administered labours.

DR. MURDOCK CHISHOLM

A long and distinguished career was honoured by Dalhousie University at its Centenary, when the degree of LL.D. (Honoris Causa) was conferred upon Dr. Murdoch Chisholm, of Halifax. Graduating from McGill in 1879, Dr. Chisholm qualified for the degree of L.R.C.P. some seven years later. Upon returning to Canada he was appointed Professor of Medicine in the Halifax Medical College. This department he directed very successfully until the year 1891, when he then took the Chair of Surgery in Dalhousie University, which position he still holds, having for more than a quarter of a century conducted the work of the Department with untiring zeal and energy.

Together with professorial duties, a wide and distinguished practice, the doctor has also achieved considerable distinction as a contributor to the medical literature of our time, his article on "Extra-Uterine Pregnancy" ranking as one of the foremost medical contributions. His literary versatility has also found expression in "Glimpses of Destiny," "Advice to Young Graduates" and "The Recoil of Professionalism". His latest book, "Notes on a Trip to the Old Country," has been read very widely, both within and without the medical profession.

Dr. Chisholm's many friends throughout Canada will join with us in extending heartiest congratulations upon the well deserved honour which has been conferred upon him by Dalhousie University.

Quarterly to Monthly

IT affords us much pleasure to announce to the Profession that the Editorial Board of the Canadian Medical Quarterly has decided that, commencing with the February issue, the Quarterly will be superseded by a monthly publication to be known as the Canadian Medical Monthly.

Almost meteoric has been the career of the Quarterly. Eighteen months ago saw its advent into the sphere of medical literature, and so rapid has been its advancement that we are now compelled to act upon the wishes of our many contributors and subscribers in deciding upon a monthly publication.

The Publishers, the Macmillans of Canada, who have always shown unremitting care and zeal in the production of the Journal, have given us absolute assurance of the continued support of their organization which will make it possible for twelve issues of the Canadian Medical Monthly to be supplied to our subscribers without any increase in the annual subscription rate.

The constant aim of the Editors will be the dissemination of meritorious medical literature emanating from the profession in Canada and other parts of the world.



Sir James Paget, F.R.S.

SIR JAMES PAGET AS A STUDENT

M. CHARLTON, Toronto

In the year 1814 there was born at Great Yarmouth, a boy, James Paget, a name which one day would be known, appreciated and honoured throughout the medical profession. His father, Stephen Paget, was a prominent and prosperous citizen of that town, having a large interest in shipbuilding and brewing. His mother, Sarah Elizabeth, daughter of Thomas Tolver, of Chester, was a woman of great beauty, gifted with rare talents and with an untiring zeal for work; a leader of the social life of the place, with a personality so charming that her society was greatly sought after. Yet she found time to devote the greater part of her leisure to the care of her children and husband. She was above all, a mother, with a passionate fondness for her children, and spared no pains to influence their education along the scientific line of which she herself was so fond. Small wonder, then, was it that her children, of whom James was the eighth, should in after life be famed for their talents and love of work. James inherited from his mother his looks, genius and character, and to her influence he was indebted for his love of botany, a study which later was to be of incalculable benefit to him.

At the time of his birth, Great Yarmouth was famous for its shipbuilding; prosperity hummed within the town, for as yet London was far enough away not to spoil trade. Many a time James found his way to the shipyards to watch with fascinated eyes the building of ships. Great, small and divers kinds were turned out, for England in those days was sending many ships coursing over the great highways of the seas. All his boyhood was passed among the familiar sights and sounds of a seafaring life. The successful launching of a ship, which he had watched being built, would be the main topic of conversation at the home fireside. The life of the sea was ever before his ardent mind, stirred as it was so often by tales of heroism and glorious deeds of the British Navy; thus, while yet a lad, he had formed a passionate attachment to a seafaring life.

As soon as he left school, which he did at sixteen, having been the head boy during his last two years, he began the study of navigation, geometry and higher mathematics, so as to prepare himself for the navy. Then came the day when his father wrote to a friend in the navy asking him to take the boy under his care. But that letter was never sent; the same evening it was destroyed by the father. It was decided at the last moment that James was not to leave for a seafaring life; he was to remain at home and take up the study of medicine instead.

And thus it was that by a mere chance the British Navy lost one who without doubt would have added another name to its long roll of glorious heroes. Reluctantly, oh, so reluctantly, he closed the books he had so eagerly read to prepare himself for the navy, and entered the office of the local practitioner, a man of considerable ability and a graduate of St. Bartholomew's. Here for four and a half years James worked with the same untiring zeal and devotion which he had already shown in whatever he undertook to do. But his time was not all devoted to the routine of the office books, bandaging, putting up of medicine, dispensing drugs and making himself generally useful to the doctor. He found time to read in his father's library a massive work of thirty-six volumes on his beloved subject of botany, and like the distinguished French surgeon Laennec, he roamed about the country adding to his collections in natural history. He taught himself French, and was soon reading and translating in that language. He soon turned with eager interest to the study of anatomy. He read and re-read the *Dublin Dissector*, Stanley's *Anatomy and Cloquet*, Cloquet being his treasured volume, prized by him above all the others. But the most remarkable undertaking at this time, 1834, was the publication, with the assistance of his brother Charles, of a work on the "Natural History of Great Yarmouth". The entomology was written by Charles, and the introduction and the botany by James. This work created much interest among the prominent writers of botany, and brought the boy into intimacy with the foremost botanists of the time; and the work stands to-day the great authority on the "Natural History of Great Yarmouth."

One of the most interesting incidents in his life came when his apprenticeship was completed: his leaving for London to enter the medical school of St. Bartholomew's Hospital. This was the first time he had left home. London loomed large on the horizon to this eager and serious minded boy. He took in everything with a glance. Nothing escaped those large, thoughtful and beautiful eyes; they swept strange people and places with a keen, analytical gaze. Always there was in his mind a hungry desire for knowledge, which to the day of his death he was forever seeking to satisfy. Hundreds of students had entered the doors of St. Bartholomew's, but how few had come prepared as James Paget.

St. Bartholomew's was not what it had been in the day of Abernethy, when that glorious student of the great John Hunter had drawn an unprecedented number of students to its doors. But when Paget entered, its former glory was somewhat revived under the teaching of Lawrence and Stanley. It is of interest to note that here Paget met William Beaumont, who later became one of Toronto's leading physicians. Later he wrote to Dr. Fraser, of Toronto, "that Dr. Beaumont was held in great esteem by all old St. Bartholomew's students". Paget also refers gracefully to him in one of his essays.

He very soon won the recognition of the professors and his associates, early becoming known throughout the school as the finest dissector. Nothing ever escaped his eagle glance; what others passed over he detected. From the dissect-

ing room Paget passed to the well equipped museum, where he spent hours, and from there to the Library to verify what he had observed. The days were not long enough for the fulfilment of his insatiable desire for knowledge; far into the night his light burned.

He began his career as a medical writer at this time, writing for the medical journals as well as other publications. His knowledge of French brought him many papers from the professors for translation; and to increase his income derived from this source, he taught himself German and Italian. Before the end of the second year he was teaching a class of students, thus adding to his meagre income; for Paget had to work his own way through school, his father having lost the greater part of his money.

At the close of the first year he led his class in all subjects and had made the important discovery, while dissecting, of the parasite "*Trichinella Spiralis*".

His second year was as brilliant as the first, and again he led in all subjects. During the second year he could only devote his spare moments to the dissecting room, as his time was largely taken up with hospital work, but whenever he could get away from his other studies he was to be found at the dissecting table. His knowledge of anatomy by this time was remarkable.

It was during this year that he became a member of the College of Surgeons. His zeal, his calm judgment and devotion to his work had marked him from the first as a student of rare ability. He was shy and retiring, and did not readily make acquaintances; but those who learned to know him well never forgot the richness and rare charm of his friendship. Already he had shown signs of what he afterwards became, the most ready, graceful and eloquent speaker in the medical world of London. While at St. Bartholomew's he had won the hearts of both professors and students, and in after years no students' gathering was thought to be complete without an address from James Paget.

DYSMENORRHOEA*

W. W. CHIPMAN, M.D., F.R.C.S., Edin., F.A.C.S., LL.D.

Professor of Gynæcology and Obstetrics, McGill University, Montreal.

"Unto the woman he said, I will greatly multiply thy sorrow" and it is with this grim denunciation that our subject deals. No small share of this woman's sorrow had been associated from the beginning with the menstrual act. Dysmenorrhœa is a recognized entity in our earliest literature, and it is with us to-day, very much with us to-day, a part of the high cost of living, the earned or unearned increment of our proud civilization. Always does it seem true that the higher and the more elaborate the national life, the greater is the divergence between the two extremes; the extremes of poverty and riches. It is the extremes always that suffer most. In my experience a sudden transfer in environment, from one extreme to the other, during the years of adolescence furnishes a causal factor in many severe dysmenorrhœas; thus the strain of adjustment.

I propose to-night to deal only with the primary or essential, the so-called idiopathic dysmenorrhœas. I mean of course by this, that there is no recognizable pathological lesion in the pelvis. To all examination the organs appear healthy, though the uterus may be small and is frequently flexed. Such are the pelvic findings in the typical cases of the dysmenorrhœas of adolescence. For it is during the menarche, the years from puberty to maturity, while the regular rhythm of the menstrual habit is being attained, that these typical cases occur. These are the cases only which we will consider, those most troublesome cases, a bug-bear to medical practice.

By dysmenorrhœa then, we mean pain associated with the menstrual act; and I shall dignify by this term only those cases that are sufficiently severe to cause a degree of disablement. The pain must be felt within the genital sphere, that is, between the umbilicus and the knees, though I shall include later the comparatively small group of cases where, with this pain, the migraine syndrome of severe headache, nausea and vomiting is associated. This dysmenorrhœa which we consider is Muellerian in situation and is concerned chiefly with the uterus. Of the rare ovarian dysmenorrhœa, the "Mittel-Schmerz" or middle pain I shall not speak.

As to the incidence of dysmenorrhœa, reliable figures are difficult to obtain. One of the most exhaustive studies of this question was made some six years ago by Dr. Catherine Chisholm, who, taking five hundred cases from middle

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class life in England, school girls for the most part, found that in 58 p.c. there was no discomfort of any kind during the menstrual period; in 33 p.c. there was slight and occasional pain, while only in 8 p.c. was this pain sufficiently severe to cause disablement. These figures are somewhat surprising, and are much more favourable than those of Giles, who of 100 cases during the same adolescent years found 35 p.c. with no pain, 36 p.c. with little pain and 29 p.c. where the pain was severe and disabling. Dr. Giles' figures are in my experience much nearer the truth of the condition as it obtains in Canada. Moreover, Dr. Catherine Chisholm holds a special brief in maintaining vocational equality of the sexes. During the past year I have had in my own practice fifteen such cases. These patients came from all walks of life. The pain was severe and disabling; they were all adolescent and there was no pathological lesion in the pelvis. I can truly say of these fifteen cases, that sufficiently a bug-bear I found them.

Ætiology.

The ætiology of this condition has remained stubbornly obscure. In fact, until recently the work on this subject has been for the greater part insular and disassociate, and has consisted almost entirely of academical discussions as to the attitude, size and shape of the individual uterus. Following Schauta, elaborate classifications have been created of the different varieties of dysmenorrhœa. These classifications still obtain in our medical literature, they are still in use, and the pain is variously designated mechanical or obstructive, inflammatory or rheumatic, and reflex or nervous, according to the fancy of the observer; truly a vain repetition.

It is only during the past ten years that a wider outlook has been obtained. During this time there have been studies in Embryology which have shown more clearly the genesis and the essential structure of the genital tract, and especially that of the uterus; while in Bio-chemistry there have been revealed in part the wonderful secrets of the endocrine system, as the determining factor in development and growth. It is with this essential structure, and its development and growth, especially as it pertains to the uterus, that we are particularly concerned. In this uterus the development must be complete and the growth must be average or normal—weight for age, as it were—in order that a normal physiological habit of menstruation be attained. Any failure here means of necessity a depraved habit; and the outstanding clinical mark of this depravity is an adolescent dysmenorrhœa. A deformed or undersized uterus in its essential structure departs always from the average or normal; the elastic and non-elastic tissues are always in disproportion, the mesometrium is unduly fibrous and the endometrium is atrophic and thin. The menstrual wave finds such a uterus unresponsive and resistant. The organ is inadequate to the work it is called upon to do, and there is consequently a failure in function, expressed here, as everywhere, in terms of pain.

You will remember, then, that the growth of the uterus is most rapid at

puberty, though it persists to the twenty-third year, when only the organ is mature. This growth depends upon, not only the vigor and activity of the sex-gland itself, but also upon the integrity of the whole endocrine system. The ovary, it is true, is the determinant sex-gland in the female, and is consequently mainly responsible for the primary sex-characters. But closely associated with it are the Hypophysis, its anterior lobe and the cortex of the Adrenal for these in their turn govern and control, not only the *growth* of the genital system, but also the appearance of secondary sex-characters. The Hypophysis is essentially a puberty gland and almost as much can be said for the cortex of the Adrenal. The integrity of this glandular trinity, Ovary, Hypophysis and Adrenal, is absolutely necessary to the attainment of female maturity. It may be stated, moreover, that the degree of perfection in the secondary sex-characters is a correct measure of the maturity of growth in the uterus and genital tract itself; the girl looks the part; the one is an index of the other.

Shortly then, these are the broad terms of the riddle; the solution of this riddle is for the future.

Accordingly, in regard to the Aetiology of dysmenorrhœa I shall present the following considerations:—

1. The essential structure of the uterus, clearly visible in foetal and infant life is that of an erectile organ, a trabecular arrangement of musculo-fibrous tissue, surrounding venous spaces. In the adult these venous spaces are potential rather than actual, and the trabeculae are fibro-muscular bands.

2. The unstriped muscular fibre of the uterus develops from the embryonic mesoderm or mesenchyme within the trabeculae of this cavernous mesh-work. In normal cases a definite proportion is maintained between these elastic and non-elastic tissues—between the muscular and the fibrous tissues of the mesometrium.

3. The uterus is a primary sex-organ, and owes closest allegiance to the ovary. Its growth however, is controlled by the endocrine system, notably the anterior lobe of the Hypophysis and the cortex of the Adrenal. This growth is greatest at puberty, and coincides in time with the appearance of the secondary sex characters. The perfection of these characters is a measure of this growth.

4. Sex quality is not only qualitative but quantitative, and one sex contains always something of the other. The early embryo morphologically has no sex identification. Its primary sex-characters may become either male or female, for it possesses in itself the rudiments of both, and may use one or the other. There are degrees of female-ness or femininity, according as the individual possesses more or less male-ness; more male-ness argues less female-ness, and less perfection in both primary and secondary sex-characters. In such a female the uterus is small and unduly fibrous, while the secondary sex-characters are unpronounced or ambiguous. Such a woman will suffer a dysmenorrhœa.

I shall now discuss these considerations somewhat in detail. In this description of the uterus as an erectile organ, I shall follow the admirable paper, pub-

lished some seven years ago by H. Reginald Clarke of Manchester, England. Clarke begins his study at the third month of intra-uterine life, and continues it through infancy, childhood and adolescence.

At the third month of fetal life the mesometrium consists of a delicate connective tissue with broader connective tissue strands, and a few small spaces which appear to contain blood corpuscles. At the fourteenth week these spaces are larger, but it is only at the fifth month, the twentieth week, that they are lined with endothelium, and are true venous spaces. Small curling arteries grow inward from the broad ligaments and run in the trabeculae which enclose these spaces. At the eighth month these arteries can be traced as far as the endometrium, the surface of which they reach at term. During infancy a cavernous condition exists in the mesometrium, similar to that which exists in other erectile tissues, for example, the corpora cavernosa. This trabecular condition resembles that which occurs in the fetal heart of man, or which persists throughout life in the hearts of the amphibians, for example, the frog. In the adult uterus these venous spaces are not obliterated, they are potential rather than actual, and persist as slit-like peri-arterial sinuses, lined by delicate endothelium. They are concerned, become actual in the erection of the uterus for example, during the impact of the menstrual wave, and in the formation of maternal blood-sinuses during pregnancy.

Clarke also studies the growth of muscular tissue in the uterus, and by means of Meier's method (Van Gieson's differential stain) has established a ratio of growth between the muscular and the fibrous tissue. At the third month of fetal life the muscular tissue was less than 35 p.c. At term it is about 46 p.c.; at the 7th year 52 p.c.; at the 14th year 62 p.c., and at the 21st year 65 p.c.; so that at the third month of fetal life there is in the uterus 35 p.c. of muscle tissue, and 65 p.c. of fibrous tissue. At the end of the menarche, the twenty-third year, the percentage is just reversed. For the muscle tissue is now 35 p.c. and the fibrous tissue 65 p.c. Roughly, the muscular tissue is double that of the fibrous tissue in a healthy uterus of average size. Such, then, is the structure of a normal uterus, of this normal "pelvic heart."

Such a uterus will menstruate painlessly, there will be no dysmenorrhœa. The larger part of this tissue is expansile and resilient, and so responds easily to the menstrual congestion. Its systole and diastole are well timed and co-ordinate.

It follows, now, that anything that retards the growth of this uterus, or disturbs this musculo-fibrous proportion, will lead to an impairment of function. This disturbing factor is to be found, I take it, in some fault of the endocrine system. As we have said, these ductless glands, especially Hypophysis and Adrenal govern and control the growth of the uterus, while at the same time they dictate the terms of the secondary sex-characters.

Of the ductless glands it may be stated that no one of them acts independently, that there is always between them a close co-relation. In this mutual

balance any dystrophy of one gland will in consequence affect the secretion of the other, and the clinical picture is therefore poly-glandular. For our present purpose, however, it is the influence of the Hypophysis or Pituitary gland that is most conspicuous and it is this influence with that of the ovary which I shall chiefly consider.

Both experiment and clinical observation afford abundant proof that the influence of this Pituitary gland is essential to the normal growth of the sex-organs, and to the acquirement of the secondary sex-characters. The phenomena of puberty depend on the interaction of this gland with the ovary. If the Pituitary be removed in a young animal, the sex-organs will retain their infantile type and the secondary sex-characters will not develop. It follows from this that the growth of the uterus during the years of the menarche depends largely upon the integrity of the Hypophysis. Again it has been observed that if this growth proceed at a usual or normal rate, a proper ratio of muscle and fibrous tissue is always preserved in the growing organ. It is only when the uterus is under-sized that this relative proportion is lost, at the expense always of the more highly developed tissue. Hence the small uterus is always unduly hard and fibrous.

Again, a primary flexion of the uterus is a second and more conspicuous expression of this imperfect growth. Here symmetry is lost. For one wall of the uterus, usually the posterior, has grown much more rapidly than the other; and in consequence the uterus is bent sharply forward. This is the so-called "cochleate uterus," the uterus of acute anteflexion. Not only is it fibrous, hard and undersized, but in this way it is deformed.

From our present knowledge I think we can assume that this imperfect growth of the uterus, this retention of its infantile type, is associated with some functional disturbance in the Hypophysis, especially in its anterior lobe. There is here an under- a hypo-secretion, a degree of hypo-pituitarism, associated it may be, with some sex gland dystrophy, an ovarian insufficiency. These are the cases that are not pronounced in their female-ness, their secondary sex-characters lack perfection. Puberty here is not that of Ezekiel "thy breasts are fashioned and thy hair is grown, whereas thou wast naked and bare." I have in this connection observed two main types of sex-imperfection, the one type is more definitely hypo-pituitary, and the other more hypo-ovarian. In both the uterus is undersized.

In the first, the hypo-pituitary, the girl is often of good build, though the long bones may be unduly short; there is a tendency to obesity, and the breasts are fat and non-glandular; the hands are small with tapering fingers—they are always cold; there is hypo-trichosis, and although in good health she is rather listless and indolent. The external genitals are normal and the pelvis may be well formed. An extreme degree of this type is found in the cases of "dystrophy adiposa genitalis" first described by Froelich, in 1901, and now so definitely recognized.

The second type is the hypo-ovarian. Here the girl approaches the type of the male, with the short trunk and the long extremities; the shoulders are broad, and the pelvis narrow, and often funnel shaped. The breasts are small and there is hyper-trichosis, with male distribution. Such a girl is often athletic and masculine in her propensities.

While the above represents two types, there are of course all gradations between them; or these sex-stigmata may be single, as it were sporadic. A degree of chlorosis is a common feature in these cases, for, as is generally known, there is a close relationship between the hæmopoetic and the genital systems. The anaplasia is always associate. Like the uterus, the heart grows most rapidly during the early years of adolescence. The chlorosis, this primary deficiency in hæmoglobin, the iron-containing oxygen-carrier of the blood, means decreased oxidation of the tissue, and hence a further tendency to obesity and to increased sugar-tolerance.

These are the cases of essential dysmenorrhœa. The uterus is small, often acutely anteflexed, and sex-stigmata are present in greater or less number and degree. The cause of the pain is in the uterus itself. Deficient in its elastic muscular element, it does not easily experience erection in response to the menstrual wave. There is in consequence increased intra-mural tension, with a resulting spasm. A condition of chordee exists, where the polarity of the organ is lost; and the difficulty is not so much for the blood to get out of the uterine cavity as to get evenly into the uterine wall.

In such way then are the well known cases of infantile uterus and congenital atrophy with their associate syndrome to be explained. Not so long ago the blame of this hypophyseal dystrophy was laid altogether upon this uterus, and its flexion was called a "displacement." Accordingly, this unoffending organ, more sinned against than sinning, was at once dilated and often curetted (having not mucosa enough, there was taken away even that which she had) and generally man-handled. The point of this argument is that in so treating a uterus we are dealing with an effect and not a cause. We are meddling and unscientific. Recent researches carry the cause a step forward into the biochemistry of the endocrine system and as clinicians we must follow.

And in the meantime, is there any help in our present trouble? Knowing more of the cause of dysmenorrhœa, are we from this knowledge better able to treat it? Can we supply the deficient secretions of any of ductless glands and so establish a normal balance between them? The practical results of organotherapy are, as you know, immature and inconclusive. Yet the experimental results of Howell, Emil Goetsch, Hoskins and Swale Vincent, to name only a few from this country, promise much.

Emil Goetsch, by feeding the dried powdered extract of the anterior lobe of the Pituitary or even the whole Pituitary gland, has been able to produce in rats early and increased growth in the uterine cornua. There is so produced, not only early ovulation, but an increased vascularity in the whole sexual sys-

tem, with a marked hyperplasia of the uterine mucosa, and an increase in the number and size of the muscular elements of the mesometrium.

Such feeding experiments are being carried out by numerous observers, and the results form the basis of their therapeutic use in Man.

The difficulties are many, not the least of which is the pharmacy of the glands themselves, and the rules of their exhibition are still tentative and empirical. Late results, are however, in a degree encouraging, and promise a larger and larger place in our therapeutic equipment. I always employ it in selected cases.

Treatment.

I shall briefly outline a clinical case, and indicate in a broad way its conduct and treatment. I shall select a common instance, one which shows a mild degree of hypo-pituitarism. Remember, Gentlemen, I do not forget the school-teacher, the shop-girl and the stenographer. Treatment here is easy. Reform her way of living. Pay a living wage; the problem is one of economics.

The girl is seventeen and is at boarding-school. She is large and well built, though inclined to obesity, and there is the small cold hand with tapering fingers. She is anæmic, indolent and has a distaste for exercise. She is always tired, shows mental lassitude, and has little interest in anything, even in herself.

This girl began to menstruate late, a year ago, at sixteen. The menstrual loss is scanty, somewhat irregular and has been extremely painful from the beginning. Her mother tells us that she has a "poor circulation," that she suffers from gastric disturbance, has palpitation of the heart. In the last two years she has gained considerably in weight.

The current history reveals in addition to the sedentary habit, an irrational indulgence in sweets, that she drinks no water save at meals, and is sublimely innocent of any regular evacuation of the bowel. Such is the history, it is almost a refrain.

The menstrual pain is severe and spasmodic in character; in time it is premenstrual, and is felt chiefly in the hypogastrium. There is a one-day disablement, which is described by the mother as a recurrent agony, a statement in which the girl acquiesces.

In the conduct of this case, it goes without saying that the examination of such a patient is to be first a thoroughly general one. The first thing here is not to make a vaginal examination. This is not the first but the last thing to do. From the appearance of the patient and the menstrual history—the late onset, scanty and painful flow, we can take odds that, while the Muellerian tract is immature and infantile, it is not diseased. The first thing in order is a thorough systematic general examination, beginning with the teeth and ending with the cold feet—for here the feet are always cold. Go carefully over the different systems, especially the lungs, and examine the urine and the blood. The latter often shows a primary anæmia, a chlorosis, and it is wise to estimate here the sugar tolerance. As regards the pelvis, inspect only the vulva, hymen and urethra

for evidence of masturbation or gonorrhoeal infection; it is an imperfect world. If a pelvic examination is necessary, it is made per rectum, or under an anæsthetic, for every effort is made to keep this young girl's attention diverted from her sexual-organs.

The treatment is determined naturally by the findings. If there be no organic disease there remains in this case the faulty metabolism. You will begin by a hygienic reform of her daily life. Elimination is the missing word in her vocabulary. Encourage the intake of water and compel the bowels to one complete evacuation after breakfast. Make this by education, exercise and diet as the sun rises, an invariable rule. Control the indulgence in sweets. Cane-sugar aggravates all dysmenorrhœas.

Gland therapy is always employed. In this case of mild hypo-pituitarism, the extract of the anterior lobe, 5 grs. three times a day with or without a similar dose of Ovarian Extract, or the Extract of the Corpus Luteum, is exhibited. If the patient is over-weight, a small dose of Thyroid Extract, say half to one grain three times a day, is also added. The exhibition of this Thyroid stimulates oxidation processes in the body, and is to be used where there is high sugar-tolerance, or where the blood pressure tends to elevation. If the blood pressure is persistently low, Adrenalin, one two-hundredth of a grain from the cortex of the Adrenal, may be given. This feeding is persisted in for months, with short intermissions. The Extracts administered, and their combination, vary of course with the individual case.

The results of this glandular feeding have, in my own experience, not been uniformly successful. Still, a certain number of cases have profited thereby and I am decidedly encouraged to continue their use. The younger the patient the better the prognosis.

In the further general treatment I employ daily a mild Chalybeate Saline, and frequently give iron or arsenic. Prescribe a holiday with a change of barometric pressure; in my experience a high reading, for example, at the seaside, gives the best result.

So in these ways you improve the general health, ballast the crank-nervous system, and it is often cranky, and promote muscular growth in the small under-sized uterus.

And now for the treatment of the pain itself. The secret of success is to anticipate the pain, create a state of general preparedness. These are the orders:—Six hours before the onset of the severe pain, remove the corsets and lie down, preferably in bed. Keep warmly covered and place a hot water bottle at each foot, so bleeding yourself into your feet. Take enough castor-oil or Laxol to make the bowels move twice. All this is six hours before the onset of the pain. If pain still supervene, take a teaspoonful of Sal Volatile or of Viburnum Compound in hot water, every hour, for three doses; or in like fashion 5 grs. of Aspirin or Phenacetin. Alcohol or Morphia you take never.

Such, Gentlemen, are the directions, both general and special and it certainly

is encouraging how often they succeed. Of the fifteen cases during the past year, there were only three where I was compelled to dilate the cervical canal; and I only once used the cervical stem. Surgical procedures are here always to be regretted. For while the relief is frequently transient they magnify in the mind of the patient the sense of her sexual disability. We must never forget that the Sensorium is above the neck. I need not say that the ovaries are never to be removed for dysmenorrhœa.

In the rare cases of dysmenorrhœa with the migraine syndrome of headache, nausea and vomiting, nothing succeeds so well as the cauterization of the erectile tissue in the nose. This tissue is found at the anterior end of the lower turbinate and in the tuberculum of the septum. These two areas may be termed "genital spots" and their connection with the sexual-organs must be through the sympathetic, by way probably, of the deep petrosal nerve. Fliess speaks of these cases as "nasal dysmenorrhœa" and his results have been verified in this country by Brettauer and Mayer of New York City.

The method employed is to cocainise these nasal areas during the attack. If relief is so secured, these spots are subsequently cauterised by the electro-cautery.

In the last ten years I have seen three such cases, and in two the relief was instant and complete.

Some you can never cure, they must be born again.

CANCER OF RECTUM AND PELVIC COLON.

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Cancer of the rectum occurs in about 4 per cent. of all cases of cancer, and of cancer of the intestinal tract about 80 per cent. are found in the lower bowel. Cancer of the rectum would seem at first sight to be a most hopeless disease, whereas if early diagnosed and radically removed the prognosis is extremely favourable. The problem with cancer of the rectum, as in cancer in any part of the body, is, from a surgical point of view, one of early diagnosis. It is the exception to see a case of rectal cancer in which the diagnosis could not have been, and should have been, made some months sooner. The fault often lies with the patient but, unfortunately, too frequently the practitioner who is first consulted overlooks the serious significance of the symptoms complained of. In only two of my cases in a series of twenty-three had proper examination been undertaken or advised, and a correct diagnosis arrived at without any loss of time.

The only safe course for the practitioner to assume, is to refuse to treat any case complaining of symptoms of rectal trouble from any cause without at least a digital examination and, if necessary in his judgment, special examination with proctoscope, sigmoidoscope, or X-Ray. By adopting this rule many cases will be recognized early, which heretofore had been passed over, as benign conditions. The late Prof. John Chiene of Edinburgh, repeatedly taught that—"If a patient has a pain between the knee and the naval put your finger in the rectum."

The ætiology of cancer of the rectum, as that of cancer generally, is still unknown. Apparently several predisposing factors seem to obtain. It is essentially a disease of middle life and old age, yet many cases have been observed in quite young individuals. Thus Ball¹ has seen three cases under 20 years of age and Clogg² has seen one at the age of 13.

One remarkable case occurred in my series. The patient was a young woman aged 24 who had advanced cancer of the rectum. She gave a history that two of her brothers had died in England of cancer of the bowel at the ages of seven and eleven years. I wrote to the physician who attended these two boys requesting notes on the cases and information as to whether any pathological

examination had been made. He replied that specimens of the growth had not been examined, but that the patients died with all the clinical symptoms of cancer of the bowel. Another case was only 24 years of age. The oldest patient in my series was 69 years. Sex seems to have no influence on the frequency of rectal cancer, as shown by a large series of statistics. The influence of heredity on the incidence of cancer has been frequently noted, and the appearance of this disease in two or three succeeding generations is sometimes most marked.

PATHOLOGY

The tumour is adeno-carcinoma in type and is columnar-celled. It originates in the glands or follicles of the mucosa, spreads circumferentially and longitudinally in the sub-mucous tissue, and may attain considerable size before disintegration of the surface epithelium takes place. When originating in the anal canal the type is squamous-celled epithelioma.

It spreads by (1) direct permeation, (2) by the lymph channels, and (3) by the blood stream.

1. Direct permeation. In time all the coats of the bowel become invaded by the cancer cells and later contiguous organs and structures become involved.

2. By the lymph channels. At the junction of the rectal and anal mucosa is what Davis has happily termed a sort of lymphatic watershed, with the lymph flow of the anal region passing towards the inguinal glands, while that from the ampulla passes to the para-rectal and pre-sacral glands. This is due to the fact that the two structures originate from different embryologic sources. The analplate or proctodeum comes from an infolding of the ectoderm, or epiblast, hence, the drainage of the anal canal is the same as that of the skin in the surrounding region. The rectum is developed from the hind gut and is derived from the entoderm or hypoblast. Drainage from here is towards the glands along the hæmorrhoidal veins, the para-rectal above the attachment of the levatores ani muscles. Secondary glands to become involved as the disease progresses are the pre-sacral, those along the external iliac vessels, the glands along the inferior mesenteric vessels, and the lumbar glands. Enlarged glands are not necessarily always cancerous. They may be enlarged from septic absorption from an ulcerating growth. Pennington³ collected 997 necropsies of cancer of the rectum and found in only one-third the regional nodes affected.

3. Spread by the blood stream. The venous return from the rectum is into the hæmorrhoidal plexus, from which it is drained by the superior hæmorrhoidal vein into the portal system, and by the middle and inferior hæmorrhoidal veins into the internal iliac and thus into the systemic circulation. Malignant emboli may therefore be carried to the liver and other parts of the body. The percentage of metastases, however, is small. Thus Clogg⁴ in 50 autopsies on patients dying of the disease found metastases in the liver in only seven, and in

the spleen one. The late John B. Murphy⁵ tabulated 10,310 necropsies for cancer in all parts of the body and found 19.7 per cent. had no metastases. The proportion for the rectum was 22.2 per cent.

SYMPTOMS

The recognition of cancer of the rectum in its early stage is so important that a review of its mode of onset and symptoms would not be out of place. The average textbook description of the symptoms is a description of the disease in an advanced and hopeless stage, when it has little interest to the surgeon from the curative point of view.

Goodsall and Miles⁶ by obtaining full histories from their patients endeavoured to find some symptom which manifests itself sometime during the year or two preceding the appearance of objective phenomena: "In almost every case one symptom appears to have been almost always present, and that is a prolonged and well marked attack of constipation supervening in those whose bowels had hitherto acted regularly every day without the aid of aperients. With the exception of this attack of constipation, the majority of patients say they had enjoyed good health for many years. There is seldom any history of previous serious illness." When this departure from the natural and unaided movement of the bowels has existed for a period varying from three to six weeks, diarrhoea, slight at first but showing a tendency to become more marked as time goes on, supervenes. These may be said to be the symptoms before disintegration of the surface epithelium has taken place. When blood and mucus appear in the stools in from six to nine months later it is obvious that the disease is now well under way, and yet how seldom one sees these cases before this stage is reached. In my own personal experience I have not seen one and I think this too is the experience of many surgeons.

Pain is a very late symptom in rectal carcinoma. There is, however, often a sensation of fullness and discomfort complained of, as if the bowels were not completely emptied. When the growth is low down and early encroaches on the sensitive mucous membrane of the anal canal pain is then a somewhat earlier symptom. So many patients when told they have a malignant growth express surprise and doubt because they have not suffered pain. The public require to be re-educated regarding the signs and symptoms suggestive of cancer. They only remember those symptoms that attend the terminal stages of this terrible disease.

Intestinal obstruction is necessarily a late phenomenon. Three cases in my series were suffering from acute intestinal obstruction when first seen by a physician. Acute obstruction is the end-result of a chronic obstruction due to a closing of the lumen of the bowel by an annular growth. It should be borne in mind that the primary attack of constipation already mentioned as the first

symptom seems to be due to the presence of the growth, even though small, interfering with normal peristalsis and not to a narrowing of the lumen of the bowel per se, and should not therefore be confused with the constipation due to chronic obstruction.

EXAMINATION

A careful general abdominal examination should precede rectal examination in every case. This is not only important in a methodical investigation of a case, but also paves the way for subsequent rectal examination in sensitive individuals. In the abdominal examination one has in mind enlarged lumbar lymph glands or nodules in the omentum or peritoneum, enlargement or irregularity of the liver, or fluid in the peritoneal cavity. The inguinal lymph glands should also be palpated. Note should be made of any symptom suggestive of metastasis in bones, lungs, or other viscera.

Inspection of the anal region in the earlier stages will probably reveal congestion, a livid tinge of the mucosa, and a relaxed or patulous anal opening. This is probably the result of frequent action of the bowels. Hæmorrhoids are frequently present and often secondary, and may lead to errors in diagnosis. As a late manifestation œdema of the anal skin the vulva or scrotum may be seen. Goodsall and Miles⁷ state that this is the direct result of blocking of the lymph stream from these parts. It would seem to me that this would more likely be due to obstruction of the hæmorrhoidal veins, because the lymph from this region drains by the inguinal glands and unless they are involved lymphœdema of this region should not occur.

When the common iliac vein on one side becomes obstructed from pressure by enlarged glands œdema of the corresponding lower extremity results, but should both extremities become œdematous, the inferior vena cava is obstructed.

As about three out of four cases of all growths of the large bowel are within reach of the examining finger, the importance of digital rectal examination is obvious. Should examination up to this point be negative the next step would be a proctoscopic or sigmoidoscopic examination. With the sigmoidoscope it is possible in nearly all cases to examine the bowel and to obtain specimens for microscopic examination as high up as the middle of the upper part of the pelvic colon or sigmoid. Should the growth be still higher it may be possible to palpate it through the abdomen. The sigmoidoscope should not be used when the patient is under the influence of a general anæsthetic except with the greatest care, because of the danger pointed out by Mummery⁸ of rupture of the bowel. I know myself of one such accident though the patient recovered after immediate laparotomy and suture of the rent in the bowel.

The barium enema and X-ray examination is of great value in locating tumours or strictures that cannot be felt per rectum or reached with the

sigmoidoscope, nor palpated through the abdominal wall. In one case, on account of a retro displacement of the uterus and pelvic adhesions from a previous attack of peritonitis, I was not able to pass the sigmoidoscope to the growth. Valuable information was, however, obtained by a barium enema and stereoscopic plates.

Diascopic examination combined with opaque enema by an X-ray expert is as important—or more so—than X-ray plates, and X-ray plates unless taken stereoscopically are practically useless for accurate diagnosis.

DIAGNOSIS

The diagnosis as a rule is not difficult if a thorough examination is made and the possibility of cancer in patients complaining of rectal symptoms always borne in mind. Surgeons should adopt the rule of never operating on hæmorrhoids without first going carefully into the history of the case and also making a thorough rectal and abdominal examination. This is supported by the fact that Lynch⁹ found that 10 p. c. of their cases of rectal cancer had been operated upon for hæmorrhoids previously to their seeing them, and Davis¹⁰ states that about one-third of all cases of rectal cancer operated on in the Presbyterian Hospital of Chicago during the last ten years have had an operation for hæmorrhoids within a few months previous to their entrance with malignant disease finally demonstrated.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis has to be made from inflammatory and non-inflammatory conditions. If these are kept in mind the differentiation presents no special difficulties, and as they are fully dealt with in all textbooks on the subject, simple enumeration here will suffice:

Inflammatory

a. Specific Ulceration

1. Tubercle.
2. Syphilis.
3. Actinomycosis.
4. Dysenteric.
5. Gonorrhœal Proctitis.

b. Non-Specific Ulceration

1. Septic.
2. Chronic diffuse Ulceration of unknown origin.
3. Follicular.
4. Following Injury.
5. Mucous Colitis

c. Pericolic Inflammatory Conditions

1. Periproctitis and Pericolic adhesions.
2. Diverticulitis.

Non-Inflammatory a. Non-neoplastic.

1. Hæmorrhoids.
2. Prolapsus Ani.
3. Stricture.
4. Impacted Foreign Body, e.g., Gallstone, Fecal Impaction.

b. Neoplastic

Non-malignant

1. Fibroma.
2. Papilloma.
3. Adenoma.

Malignant

1. Sarcoma.

OPERATIVE TREATMENT

PRELIMINARY COLOSTOMY. The question of preliminary colostomy in all cases is debatable. When the operation is limited to a local excision of the tumour in the early stage, or a perineal operation for an early growth very near the anus, it is not necessary. An extensive sacral (Kraske) operation may be successfully done without a colostomy. There are, however, two positive indications for colostomy, viz., when definite signs of obstruction are present, and when a combined abdomino-perineal operation is undertaken. The colostomy may be either a temporary or permanent one. It may be done a week or more before a radical operation is undertaken, or it may be done at the same time—as performed by Ochsner¹¹. I think, however, that our operative mortality will be lower if done sometime before the radical operation. If a combined abdominal and perineal operation is to be undertaken, the colostomy is done at the time the abdominal part of the procedure is taking place, and it may be done as a temporary or permanent measure—depending on the length of sigmoid available and the amount of bowel to be removed. If a temporary opening is to be made, a loop as high as possible in the sigmoid is brought well out to the side, through a muscle-splitting incision, and a tube passed under the loop. The two limbs of the loop should be stitched together so that when the spur is to be divided later no small bowel will get between the blades of the clamp. Should a permanent colostomy be decided upon the bowel is divided as low as possible and the upper end brought out through the rectus muscle and passed for two inches under the skin before finally coming to the surface. By this method control is obtained

by a rubber ring pad applied over the opening and by the voluntary action of the rectus muscles. Furthermore, the loop of sigmoid serves as a reservoir into which the faecal matter collects. The distal end is now closed, freed, and placed in the pelvis.

The methods available for operation are:

1. Local excision of part of the circumference of the bowel wall (Bevan's operation).
2. Perineal operation (Lisfrance).
3. The sacral method (Kraske's operation).
4. The abdominal:
 - a. Paul's operation, Mikulicz operation, and modifications of each.
 - b. Resection and end to end or side to side union.
5. The abdomino-perineal operation.

1. Local excision. Bevan¹² has described a technique which appears to be satisfactory. The only question that seems to present itself is, are we sure by local excision to eradicate all the disease? This can only be settled by a consideration of statistics to determine the frequency of recurrences and operative mortality as compared with more radical methods.

2. The perineal operation (Lisfrance 1826) should be limited to the removal of epitheliomas involving only the anal region. It would appear that this operation is not entirely satisfactory. Out of 58 operations done by Miles¹³ of Glasgow there were recurrences in 55. This may be due to two reasons, first, the epithelial growths occurring in the anal region are more malignant than the columnar-celled carcinomas occurring higher up the bowel, and second, this method does not permit of quite so radical a removal as when the growth is attacked from above, i.e., by the sacral route. Furthermore, one is working from the growth in the direction of the lymph stream while by the sacral route the lymph nodes are attacked first and the growth finally removed. In every case where there is involvement of the anal canal or the recto-anal junction the inguinal glands on both sides should be removed.

3. The sacral method (Kraske's operation). This method seems to be falling into disuse, nevertheless, some excellent results have been obtained by it. The chief objection is the danger of gangrene of the end of the bowel from cutting off the circulation. This will be discussed under the abdomino-perineal operation.

4. Abdominal method. Growths in the sigmoid may be dealt with by Mikulicz operation or by resection and end to end or side to side union. Mikulicz operation (Fig. I.) is useful in cases of growths in the sigmoid, especially those

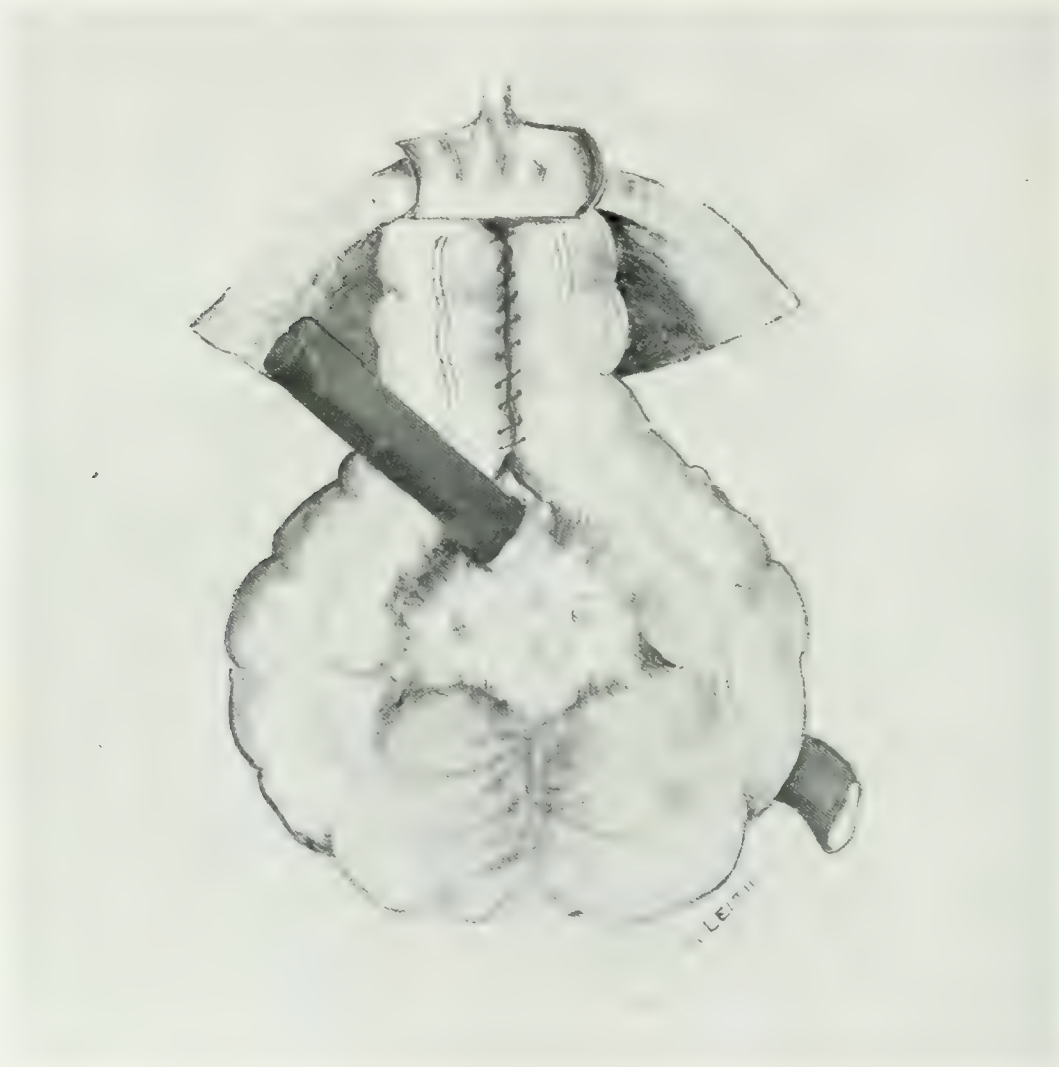


FIG. I

The tumor is drawn out through a muscle-splitting incision. Should more room be required, the sheath of the rectus can be incised and the muscle drawn to the mid-line. The proximal and distal parts of the sigmoid are sutured to form the spur. A large rubber tube is passed under the growth approximal any nodules in the meso-sigmoid.

complicated by the presence of obstruction where resection would not be advisable. For the immediate relief of obstruction a rubber tube may be purse-

strung into the proximal loop. Growths in this region not complicated by obstruction may be resected widely, including a V-shaped portion of the meso-sigmoid and lymph glands with end to end or side to side union of the bowel.

When the growth is lower, about the recto-sigmoid junction, resection and end to end union over a rubber tube may be done—as advocated by W. J. Mayo (Fig. II.).

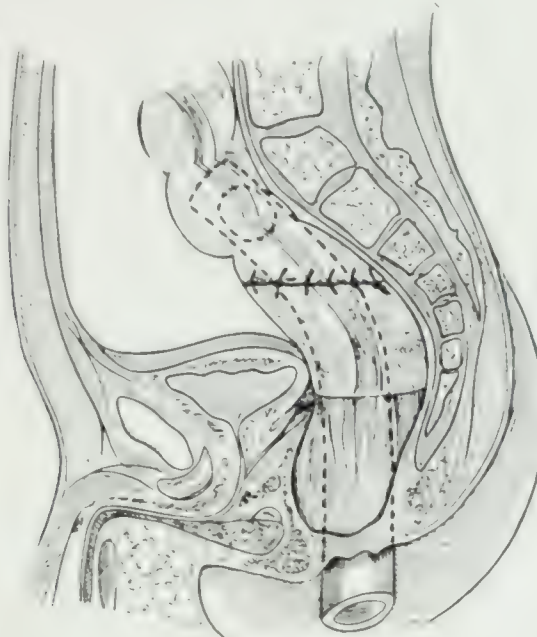


FIG. II.

Growth removed intra-abdominally and the bowel joined over a large rubber tube.
(After Mayo and Balfour)

5. The abdomino-perineal operation is the method of choice in malignant growths situated in the rectum. Its advantages are two-fold. First, should a permanent inguinal colostomy be decided upon all the bowel below the colostomy and the adjacent lymph glands can be removed. Second, should we wish to preserve the anus in its normal situation the circulation to the lower end of the bowel can be assured. It was pointed out by Sudeck¹⁴, and confirmed by Hartman¹⁵, that division of the superior hæmorrhoidal artery below the last sigmoid loop resulted in gangrene of the bowel, while in division above this point the circulation is maintained, the blood being carried to the part of the bowel supplied by the superior hæmorrhoidal through its anastomosis with the lower spontaneous cure; an example of this condition occurred in Scarpa's triangle in

sigmoid loop (Figs. III. and IV.). The abdominal part therefore of the abdomino-perineal operation may be an exploratory operation, division of the inferior mesenteric artery between the left colic artery and the last sigmoid loop, i.e.,



FIG. III

Original photograph of X-ray plate of specimen of pelvic colon and rectum injected with Barium sulphate, showing the arteries and their anastomosis. Branches given off from the sigmoid loops are end-arteries and do not anastomose.

above the "critical point", mobilization of the bowel and the establishment of an inguinal colostomy (Fig. V.). The perineal stage is done in from one to two

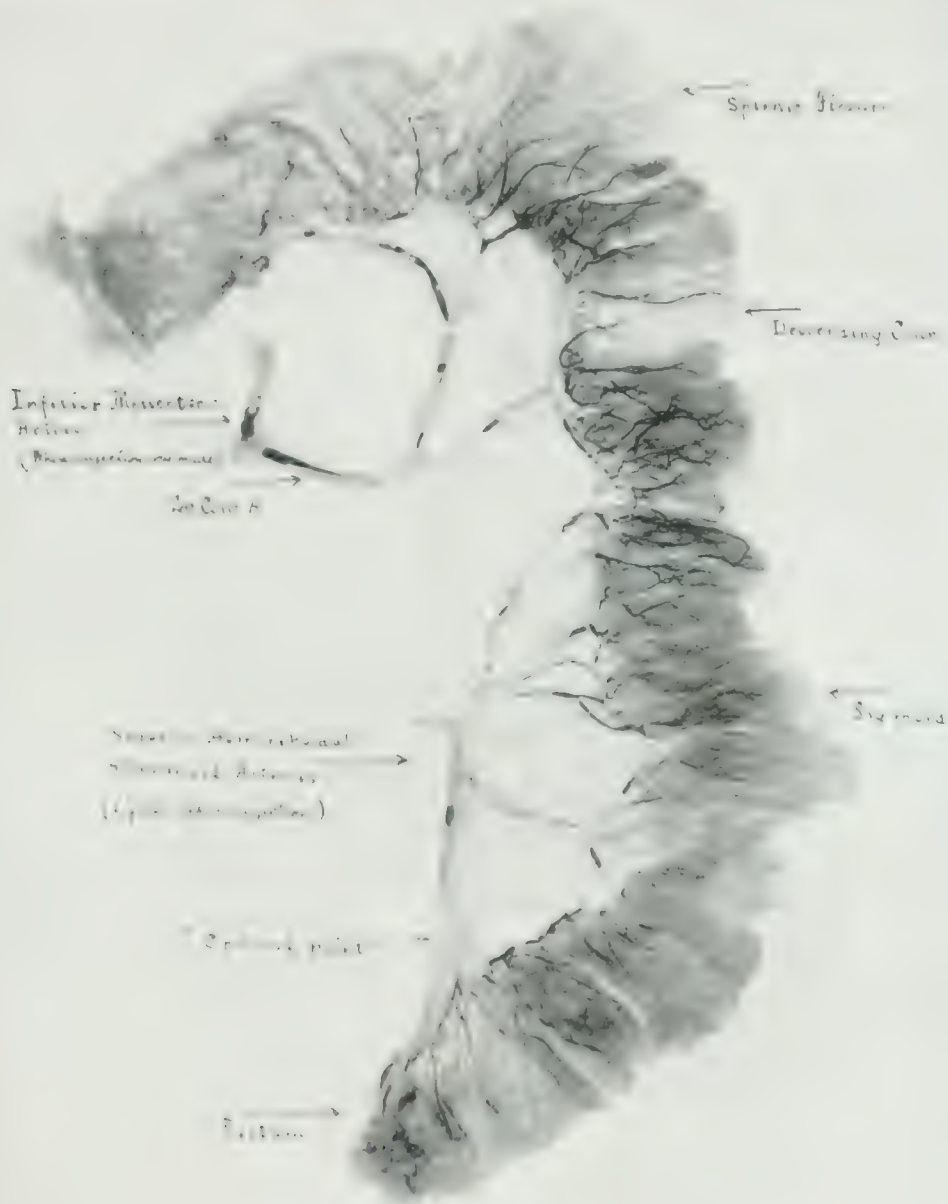


Fig. IV

Fig. IV illustrates the anastomosis of the sigmoid colon and rectum, showing the location of the critical point and the anastomosis of the sigmoid colon and rectum.

weeks when the patient's condition after the abdominal operation has become satisfactory.

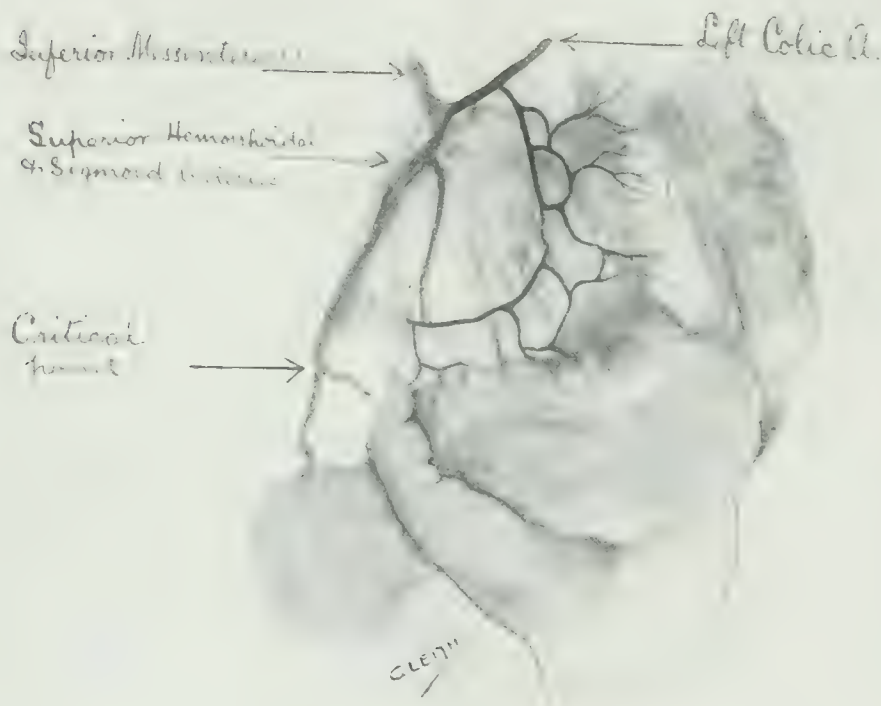


FIG. V

The left hand is passed under the meso-sigmoid, to bring into view the superior hemorrhoidal artery above its anastomosis with the last sigmoid loop.

After careful study of the circulation to the rectum from actual injected specimen, such as Figs. III. and IV., I am inclined to believe that by the sacral route, one can with care and knowledge of the vascular arrangement divide the superior hemorrhoidal vessels above the junction of the last sigmoid loop ("the critical point") and thus insure the integrity of the circulation to the part of bowel that is to take the place of that which has been removed.

SUMMARY OF CASES

I have seen in all twenty-three cases of cancer of the lower bowel. Of these eleven were extremely far advanced and considered inoperable. They were anæmic and cachectic and their tumors were definitely infiltrating the surrounding structures. In three of these cases a palliative colostomy was done. The remaining twelve cases were quite advanced when first seen by me. Two were operated on at another clinic, and one died from recurrence a year later. Three were in a condition of acute intestinal obstruction when first seen. One was completely obstructed for three days and practically moribund. She died following a cæcostomy for relief of the obstruction. One was an old man of 68 with a growth in the pelvic colon. I did a Mikulicz (modified) operation bringing the tumour well out on the abdominal wall and anchoring it to the parietal peritoneum, at the same time relieving the obstruction by purse-stringing a rubber tube into the proximal end of the loop. Ten days later the tumour was removed and the colostomy closed at a subsequent sitting. He is still alive and well after four years. The third case in addition to acute obstruction had a perforation of the bowel and beginning general peritonitis. There was free purulent fluid in the peritoneal cavity. I drained the peritoneal cavity at the same time doing a left inguinal colostomy for relief of the obstruction. She recovered and later I removed the tumour, which was at the recto-sigmoid junction, and united the bowel end to end over a large rubber tube. The faecal fistula was later closed and she has been fairly well for four years—though of late complaining of indefinite symptoms in the upper abdomen. The remaining seven cases of this series were all operated on. One died from the operation on the third day; he was 68 years of age and had been passing blood and mucus for five months before he came to me. Another patient died from acute intestinal obstruction following operation. This case was an advanced one having cancerous lymph glands in the sacral fossa. A third case died from recurrence over one year after operation. All the remaining four cases and the two cases which had acute obstruction are still alive and well—after four years.

It is a significant fact that while none of these cases could be classified as early, and some were extremely late, all that survived the operation, with the exception of one that died from recurrence, are alive and well. The first case operated on in this series seventeen years ago is in excellent health. She weighs 30 lbs. more than before her operation. Though the sphincters and 6 inches of the bowel were removed, she has very little trouble with the opening which is in the normal situation.

RESUME

1. There is always a time in the course of every cancer when it is entirely a local disease and if accessible can be completely removed. We do not know

how long this time may be in the human subject, but those who have made experiments on mice place it at 33 days.

2. Cancer of the rectum is accessible and theoretically at least should be cured in nearly every case if operated upon at the right time.

3. The public should be constantly and persistently taught regarding the symptoms that suggest cancer and advised to seek early, medical advice. In this way many cases that to-day are drifting on into a hopeless condition will be seen and treated before the advantage of time is lost.

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THE NUTRITION OF THE FETUS*

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Pregnancy is essentially a problem in nutrition, and at this time the dominant metabolic forces are those which favour growth. The mother's gradual but consistent gain in weight amounts finally to about 30 pounds; exceptionally, it is as little as 10 to 15 pounds, and at the other extreme as much as 40 to 50 pounds. With individuals inclined to be stout the increase is greater; and it is relatively greater in later pregnancies than in the first. During the early months of gestation the weight generally remains stationary or suffers a slight loss; even in those instances in which the weight begins to increase shortly after conception the gain is less marked than later. For the last three months the average monthly gain has been found to be between 3.5 and 5.5 pounds.

The mother's increase in weight is attributable in part to the fetus, the placenta, the amniotic fluid, the uterus, and the breasts; but to some extent all the maternal tissues respond to the stimulus toward growth. Probably, the relative importance of this last factor is too easily overlooked, for, naturally, the special development of the ovum first seizes upon and is likely to monopolize the attention. On the other hand, the extent of the participation of the mother's body in the growth of the gestation-period may be shown by a simple arithmetical calculation. Thus, if the weight of the product of conception at full term, together with that of the parturient uterus is deducted from the mother's total gain in weight, it appears that only about half of her increase is accounted for. Obviously, the remainder must be ascribed to her body-tissues in general. This fact suggests the correct answer to a question which physiologists have submitted directly to experiment, namely, "Does the material provided for the growth of the ovum come from the mother's tissues or from her food?"

At first it was believed that for the mother, pregnancy constituted a period of sacrifice and that fetal growth occurred at the expense of her tissues. Exceptionally, if the mother's food is inadequate, this may be true. It is conceivable, too, that small amounts of various materials derived from the mother's tissue may be contributed regularly to the ovum while its implantation is in progress, but in a quantitative sense the requirements of the very early stages of development are negligible, and the period itself is a brief one, probably no longer than the time required for adjustment between the blastocyst and the uterine circulation.

With data at hand to support it, the current view is that pregnancy represents for the mother a period of gain, rather than of sacrifice, and accordingly that her tissues are not deprived of material to supply the new organism. Both animal experiments and observations upon women indicate that the mother's food furnishes

* *For a complete discussion of the problems of nutrition during pregnancy, see the author's paper, "The Nutrition of the Fetus," published in the *Journal of the American Medical Association*, Vol. 10, No. 1, 1917. The author is indebted to Dr. J. M. S. for the privilege of using the material in this paper.*

the substances incorporated in the body of the fetus. Thus, in the case of dogs, elaborate analyses of the food on the one hand and of the excreta on the other teach that notable storage of the food-stuffs is characteristic of pregnancy. Furthermore, if this storage is compared with the amount of material contained in the bodies of the young it appears that the mother's food is sufficient not only to meet her own requirements, but also those of fetal development. Similar studies in which Bar selected rabbits as the subjects of experiment led to an identical conclusion. With regard to human pregnancy Wilson concludes from his extensive studies of nitrogenous metabolism that an ordinary diet provides for every fetal requirement and permits storage to begin in the maternal organism at a much earlier period than is generally supposed; perhaps, it begins at the very outset of pregnancy.

What are the substances required for fetal nutrition? This question may be answered in two ways. On the one hand we may infer the needs of the fetus from those of the newborn infant which is, of course, sustained by its mother's milk, a fluid of familiar composition. Or, on the other hand, upon the fair assumption that substances found in the fetus represent its requirements for growth we may resort to analysis of its body. From information of this kind we conclude that there is no great difference between the fetus and the adult so far as the quality of the food requirements are concerned; in their life-processes both use the same organic and inorganic substances which we know are always available in the circulating blood of the mother.

The constituents of the mother's blood include nutritious nitrogenous substances, carbohydrate, fat, oxygen, water, and inorganic salts which together meet all the requirements for tissue-growth and energy-production. That these are at the disposal of the fetus, there can be no question; and yet it is equally certain that none of them may pass directly into its circulation. Across the path traversed by these substances on their way from the parent to her offspring lies a complex organ, the placenta, composed partly of specialized uterine tissue, but mainly of elements derived from the luxuriant development of a portion of the fetal membranes—the chorion frondosum. The obstructive action of the placenta was proved by the experiments of John and William Hunter. These investigators showed that the mother's blood never enters the fetus and also that the reverse phenomenon is impossible. More recently and especially after the invention of the microscope and improvements in histological technique embryology gradually accumulated the facts which make the chapter on the morphology of the placenta, intimate and nearly complete.

The architectural arrangement of this organ which receives both the fetal and the maternal circulation, yet holds them apart, is so well known that there is no longer any doubt regarding the path of each of them. Venous blood from the fetus enters the placenta by way of the umbilical arteries, which divide again and again to form a multitude of capillaries. Subsequently, these reunite into a single vessel, the umbilical vein, through which the arterialized fetal blood departs.

Chiefly by the division and subdivision of the fetal vessels in the placenta, an extensive vascular bed is created. The bed is notably enlarged by the arrange-

ment of the smallest of these vessels which form loops hanging toward the maternal blood. With this, however, they do not come into direct contact, for the vascular loops are covered with connective tissue and this in turn with embryonic epithelium. Together with their enclosing layers of tissue the capillary loops constitute the chorionic villi. During the early months of pregnancy the epithelial covering of the villi forms two layers, but later is reduced to a single layer of about the thickness of endothelium. Thus, the thickness and complexity of the placental partition varies inversely with the nutritional requirements of the new organism, for at first the material requirements of the embryo are infinitesimal. Although gradually increasing, they are almost imperceptible until after the 18th to 20th week of pregnancy, and about this time also the simplification of the placental partition takes place. Therefore, it is not improbable that the anatomical transition is purposeful and intended to promote the physiological interchange between fetal and maternal circulations.

The maternal blood, which provides the fetus with what it requires for growth, and coincidentally removes its waste-products, enters the placenta through branches of the uterine arteries and departs through the uterine veins. As it passes through this organ the mother's blood comes in contact with the villi, and the requisite exchange with the fetal blood takes place. Certain substances pass in one direction while others are passing in the opposite direction, but all traverse the same placental partition which, as we have seen, consists in the latter half of pregnancy of a thin covering of epithelium, a layer of connective tissue, and within this the delicate wall of the fetal capillary.

How substances pass through this partition is a question answered thus far only hypothetically. There has been no lack of speculation on the subject, and, as an inevitable result, an enormous literature has accumulated. In the main two antagonistic theories have been developed; one of these, the vitalistic, assumes that the wall of the chorionic villus takes an active part in the placental interchange; the other, the mechanistic, regard this wall as a passive semi-permeable membrane conforming with the laws of diffusion.

1. *The Vitalistic Hypothesis.* That the placenta actually digests the food of the fetus was suggested by William Harvey, who attempted to establish a complete analogy between the chorionic and the intestinal villi. This view gained many adherents after Hofbauer and others demonstrated the presence of enzymes in the placenta, though it was never shown that these lipolytic, diastatic, and proteolytic enzymes are agents in the placental interchange. On the contrary, it is likely that they have to do only with the living processes of the cells which contain them.

2. *The Mechanistic Hypothesis.* In the transmission of a few substances, it has been positively proved that the placental partition plays a passive rôle and behaves as a semi-permeable membrane. Thus, oxygen and carbon dioxide, we are taught by the experiments of Cohnstein and Zuntz, pass equally well from mother to fetus or in the opposite direction, always moving from the point of higher to that of lower concentration. Probably, the laws of osmosis and diffusion hold true for the placental transmission of the anæsthetics, chloroform, ether, and

nitrous oxide; though they do not apply to gases, like carbon monoxide, which enter into chemical combination with hæmoglobin. Cohnstein and Zuntz also found that sodium chloride passed the placenta by osmosis. The evidence they obtained relative to the transmission of glucose was not conclusive, but it seemed likely that osmosis was the process concerned.

One fundamental fact regarding placental transmission was established by the experiments of Gusserow and his associates, namely, provided the placenta is normal, no insoluble substance may pass it. The formed elements of the blood are confined to that circulation in which they originate, consequently, the infants of mothers suffering from leukæmia present a normal blood picture. And, it is known that cinnabar, barium sulphate, and other insoluble compounds when introduced into either the mother or the fetus are effectually confined within the circulation where they were introduced. On the other hand, a variety of soluble substances when injected into the mother may later be detected in the fetus and the reverse experiment yields comparable results. From reports of such tests Kehrer stated in 1907 that of 73 substances examined 43 were found to pass readily through the placenta. Many of these substances are poisonous and were selected for that reason, because a toxic action often assists in determining the result of such an experiment. Thus, strychnine, hydrocyanic acid, nicotine, curare, pilocarpine, physostigmine, phlorizine, sodium sulphate, methylene blue, and epinephrine have been demonstrated in the mother after they were injected into the fetus.

With the exception of carbon dioxide, no fetal waste-product has been the subject of serious investigation. The suggestion of Halban and Fleck, that the chorionic villi elaborate an internal secretion which controls fetal excretion, proceeds entirely from theoretical consideration. "At present," we read in Doderlein's *Handbuch der Geburtshülfe* (1915), "it is impossible to say more than that fetal waste-products make their way to the placenta and through it reach the maternal organism which subsequently eliminates them."

Since there is so little known of the principles involved in the placental interchange and direct study of the problem by means of animal experimentation is limited by practical difficulties almost insurmountable, we turned to clinical observations in the hope of learning what is the character of the mechanism in question. We secured specimens of maternal and fetal blood simultaneously just after the infant was born. The fetal blood was obtained from the placental end of the severed cord, the maternal from one of the veins in the forearm.

The current methods for chemical analysis of the blood yield accurate results even with small specimens. Therefore, at times in a given case we were able to determine a number of the ingredients of the blood, but more frequently we were restricted to the estimation of one or two of them. Although this limitation made progress slow, it had the effect of increasing the number of cases studied and correspondingly broadened our experience. We have gathered data relative to the organic food-stuffs, protein, carbohydrate and fat, and it will be convenient to discuss these separately, in the order named, considering the waste-products of nitrogenous metabolism along with the food-stuff from which they are derived.

PROTEIN

Protein, distinguished among the food-stuffs because it contains the chemical element, nitrogen, may not be utilized directly by our tissues. Intestinal digestion breaks down protein into much simpler nitrogenous compounds, the amino acids, which are absorbed into the blood-stream and distributed to every part of the body.

NON-PROTEIN NITROGEN AND UREA NITROGEN

OF THE WHOLE BLOOD.

NO.	SOURCE	PARA	N P N	UREA-NITROGEN	REMARKS
1	Mother	I	20.2	9.3	No anaesthetic.
	Fetus		21.5	8.9	
2	Mother	I	26.5	9.8	Whiffs of chloroform.
	Fetus		27.2	10.7	
3	Mother	I	21.7	9.3	Whiffs of chloroform.
	Fetus		20.0	8.4	
4	Mother	I	20.0	9.8	Deep chloroform.
	Fetus		19.0	11.7	
5	Mother	II	22.5	9.8	No anaesthetic.
	Fetus		22.0	9.8	
6	Mother	II	23.5	10.3	No anaesthetic.
	Fetus		20.0	8.9	
7	Mother	II	21.7	10.2	No anaesthetic.
	Fetus		21.7	9.3	
8	Mother	II	21.2	8.9	Whiffs of chloroform.
	Fetus		22.5	10.3	
9	Mother	II	28.2	13.5	Whiffs of chloroform.
	Fetus		26.5	12.1	
10	Mother	II	19.5	8.4	Whiffs of chloroform.
	Fetus		19.2	7.9	
11	Mother	II	18.5	8.4	Whiffs of chloroform.
	Fetus		18.5	9.3	
12	Mother	III	26.5	10.8	Whiffs of chloroform.
	Fetus		27.5	11.7	
13	Mother	IV	27.7	13.1	Whiffs of chloroform.
	Fetus		27.2	13.5	
14	Mother	V	29.7	14.0	Whiffs of chloroform.
	Fetus		24.2	13.5	
15	Mother	VIII	27.7	11.2	No anaesthetic.
	Fetus		24.7	9.8	
16	Mother	IX	27.7	12.6	Whiffs of chloroform.
	Fetus		27.5	11.7	

It follows, then, that besides certain well-known proteins our blood contains a number of nitrogenous substances. Perhaps, it is fair to regard the blood-protein as reserve material and to regard the non-protein nitrogenous substances as those momentarily engaged in metabolism. The latter, as I have indicated, differ greatly among themselves, since they include both food-material and waste-products, but on account of a certain similarity in chemical behaviour they may be estimated collectively, and when grouped in this way they are designated as the non-protein nitrogen of the blood.

For the estimation of the non-protein nitrogen a remarkably accurate and satisfactory method was devised by Folin. We employed it in 35 cases in which normal pregnancy concluded with spontaneous delivery, and found in the case of the mother an average of 25.2 mg. of non-protein nitrogen per 100 c.c. of blood, and in the case of the fetus 24.9 mg.

The impressive resemblance between these figures does not depend upon the fact that they represent a mean value. The results are expressed in that form merely as a matter of convenience, for, examined individually, the cases exhibit the same equality of maternal and fetal non-protein nitrogen. Thus, in 20 cases the results for the two organisms did not differ by more than a milligram, and in the others the difference was usually less than two milligrams. The most instructive illustration of the presence of equal amounts of non-protein nitrogen in maternal and fetal blood is afforded by a case of twins in which the former contained 30 mg. and the latter 30.2 mg. in each of the infants.

The equality of the non-protein nitrogen in maternal and fetal blood indicates that its various constituents, belonging in part to the class of foods and in part to the class of waste-products, pass freely through the placental partition. Indeed, the suggestiveness of these results goes much further. There is evidence of a regulatory mechanism which maintains the same concentration of non-protein nitrogen in the two circulations. Such a similarity of concentration we are at a loss to explain on any other basis than that of simple diffusion. This process, as you know, permits the ready passage of certain substances through a semi-permeable membrane, and to secure equal concentrations on both sides of this partition may be said to be its very aim. However, without evidence of a more detailed character it would be hazardous to announce a final conclusion, for each of the substances concerned should be studied separately. As that has been done, we may proceed to examine the evidence as it applies individually to the amino acids, urea, ammonia, uric acid and creatinine, which together compose the non-protein nitrogen.

AMINO ACIDS

The amino acids are crystalline, more or less soluble compounds, which on account of these and other physical and chemical properties would be predicted to be diffusible substances. And they actually are, as Abel showed by means of collodion tubes ingeniously contrived to accommodate an artificial circulation of the blood and to arrange for the collection of substances escaping from the circulation by diffusion through the tube-wall. Other experimenters have confirmed Abel's statement that amino acids pass readily across such a permeable partition and that in general amino acids pass into the body tissues by the process of diffusion.

Until very recently, it was not suspected that amino acids, supplied by the mother, are the material out of which fetal protein is constructed. Albumoses were thought to serve this purpose, for although they were not demonstrable in either maternal or fetal blood, they were isolated from the placenta itself. These findings were accepted in support of the view that the placenta is a digestive organ, at first breaking down maternal protein and later reconstructing the fragments into fetal protein. But this hypothesis was never entirely satisfactory and, probably, would not have been announced if at the time it were known that amino acids are abundant in the blood. The proof of this very fundamental fact wrought revolutionary changes in our conception of tissue-metabolism in general and, so far as our immediate problem is concerned, leaves no room for doubt regarding the elementary substances the mother contributes for the manufacture of protein by the new organism. At present, there is not the slightest excuse for assuming that the placenta synthesizes protein for the fetus. This function, the fetal tissues perform for themselves. The requisite material is available in the fetal blood, having been acquired from the mother's blood. Of this we are sure, but how is their passage through the placental partition effected? Let us see what light blood analysis throws upon the subject.

AMINO ACID NITROGEN OF THE PLASMA*

NO.	SOURCE	PARA.	AMINO ACID NITROGEN	REMARKS
1	Mother Fetus	I	5.3	No anaesthesia.
			7.0	
2	Mother Fetus	II	5.9	No anaesthesia.
			7.9	
3	Mother Fetus	III	5.3	No anaesthesia.
			7.8	
4	Mother Fetus	IV	6.5	No anaesthesia.
			8.2	
5	Mother Fetus	V	7.2	No anaesthesia. Premature infant, 8th mth.
			11.9	
6	Mother Fetus	I	5.6	Whiffs of chloroform.
			7.6	
7	Mother Fetus	II	6.6	Whiffs of chloroform.
			8.3	
8	Mother Fetus	II	4.9	Whiffs of chloroform.
			6.8	
9	Mother Fetus	I	5.0	Morphine and tyramine.
			6.4	
10	Mother Fetus	I	5.6	Morphine and tyramine.
			7.3	
11	Mother Fetus	I	4.5	Deep chloroform.
			6.2	

* Analyzed with by A. H. Meyer.

It is pertinent that the blood-corpuscles are richer in amino acids than the blood-plasma, and also that the corpuscles of the fetus are richer than those of the adult. What part these facts may ultimately play in the detailed explanation of tissue-metabolism it is impossible to predict; and I am doubtful that they have any significance for our immediate problem, since only substances in solution—substances in the plasma—take part in the placental interchange. Furthermore, though many technical intricacies could be enumerated, it is perhaps, sufficient for our purpose to state that no analytical method at hand includes all of the numerous amino acids in the blood. The method devised by Van Slyke takes most of them into account, and this was the procedure used by Morse, whose results are given in the accompanying table.

An excess of amino acids amounting to 2 mg. of nitrogen appears uniformly in favor of the fetal plasma. Small as it is, such a difference in concentration implies the addition of some process to that of simple diffusion in the regulatory mechanism of the placenta. Similar results in connection with the passage of amino acids into other tissues led Van Slyke to give the name "absorption" to the phenomenon. This author found that when amino acids were injected into the circulation they diffused into the tissues rapidly and an equilibrium was reached when the tissues contained about 10 times as much amino acid nitrogen as the plasma. While equilibrium between maternal and fetal blood is obtained with only a slight difference of concentration in the amino acids of the two circulations, the results indicate that the placenta absorbs these substances and also prevents their departure from the fetal circulation.

NITROGENOUS WASTE-PRODUCTS

The substances which arise when protein is utilized by the fetus, so-called nitrogenous waste-products, are ultimately eliminated by the maternal excretory organs, chiefly the kidneys. This provision for their disposal, of course, requires that they be transferred through the placenta from fetal to maternal circulation. And, provided the pregnancy is normal, equivalent concentrations of all these substances prevail on both sides of the placental partition. Such findings would be expected only if the placental exchange was effected by diffusion.

TOTAL CREATININE OF THE PLASMA.

AUTHOR	MOTHER	FETUS	NUMBER OF CASES
Hunter and Campbell	1.67	1.75	18
Plass	1.70	1.73	12

Urea, the most abundant of the nitrogenous waste-products, is so readily diffusible that its concentration in the blood-plasma, the corpuscles and the tissues of our bodies is always the same. Consequently, before the facts were actually determined, it would have been a safe prediction that identical quantities of urea per unit volume of blood would be found in both organisms. Our observations verify this prediction, for in a series of 16 normal cases the results gave an average of 10.5 mg. of urea per 100 c.c. of blood for the mother and 10.4 mg. for the fetus. Furthermore, in the presence of complications like nephritis, where relatively large quantities of urea occur in the maternal blood, similar value obtain in

URIC ACID OF THE WHOLE BLOOD*

NO.	SOURCE	PARA.	URIC ACID	REMARKS
1	Mother	I	6.8	Chloroform.
	Fetus		5.0	
2	Mother	I	4.8	Chloroform.
	Fetus		4.5	
3	Mother	I	4.3	Chloroform.
	Fetus		4.3	
4	Mother	I	8.0	Chloroform.
	Fetus		8.1	
5	Mother	I	5.9	Chloroform.
	Fetus		5.6	
6	Mother	II	2.3	No anaesthesia.
	Fetus		2.5	
7	Mother	II	1.8	Chloroform.
	Fetus		1.8	
8	Mother	III	2.2	No anaesthesia.
	Fetus		2.0	
9	Mother	III	3.0	Chloroform.
	Fetus		3.3	
10	Mother	IV	2.0	Chloroform.
	Fetus		2.7	
11	Mother	V	2.2	No anaesthesia.
	Fetus		2.4	
12	Mother	X.	2.8	No anaesthesia.
	Fetus		2.2	

* Analyses by L. J. Bogert.

the fetal blood. The evidence, then, is conclusive that the placenta takes no active part in the elimination of fetal urea and behaves as a semi-permeable membrane.

As the method we employed to determine the quantity of urea really includes the ammonia which is present in the blood in extremely small amounts, the analytical results just referred to are doubly significant. They make it certain that ammonia, as well as urea, passes through the placenta by diffusion. That the same explanation holds also for uric acid is plain from our figures in the adjoining table which have been confirmed by Kingsbury and Sedgwick. Finally, the evidence regarding creatinine and creatine which were studied by Hunter and Campbell and by Plass, agrees perfectly with the conclusions just reached. Therefore, we are confident of the passive rôle of the placenta in the transmission of all the nitrogenous fetal waste-products. They enter the maternal circulation as freely as if the placenta did not exist, and ordinarily the estimation of the quantity of them in the mother's blood is equally valid for the blood of the fetus.

BLOOD-SUGAR

Carbohydrate, the second of the organic food-stuffs to be studied, becomes available for intermediary metabolism in the form of glucose, the blood-sugar. An excellent method for its determination devised by Benedict was the one employed by Morriss in our series of cases. For the mother, the mean value found was 0.132%, and for the fetus 0.115%. Slightly higher values occurred in the maternal blood in 19 out of 24 cases, while the values were identical in both circulations in 5 cases. Bergema stated that the sugar-content of the blood in the two organisms is always the same. But his work is open to criticism, for the specimens were not obtained simultaneously; between them at times there was an interval of twenty minutes.

These facts do not support a hypothesis requiring the action of an enzyme. Such a doctrine which is advocated by Hofbauer rests chiefly upon his demonstration of glycolytic ferments in glycerine extracts of the placenta. In all probability their function is the preparation of glycogen, stored in the decidua, for passage to the fetus. The results of blood analysis certainly do not indicate that enzymes effect the transmission of glucose through the organ. On the contrary, they speak strongly against it. Thus, in a case of double-ovum twins, where each fetus had its own placenta, the blood-sugar of one was 0.099% and of the other 0.096%, while that of the mother was 0.12%. Such findings are inexplicable, except on the basis of diffusion through the placenta; slightly higher maternal values promote a steady flow of glucose toward the fetus. This fact intimates that glucose plays a prominent rôle in fetal metabolism, a rôle not fully appreciated until viewed in the light of the fat-content of the blood.

PERCENTAGE OF SUGAR
IN THE WHOLE BLOOD*

S.O.	SOURCE	SEX	BLOOD SUGAR	REMARK
1	Mother Fetus	I	0.143 0.124	Whiffs of chloroform.
2	Mother Fetus	I	0.097 0.10	Morphine and tyramine.
3	Mother Fetus	I	0.161 0.131	Morphine and tyramine.
4	Mother Fetus	I	0.137 0.141	Whiffs of chloroform.
5	Mother Fetus	I	0.125 0.108	Whiffs of chloroform.
6	Mother Fetus	I	0.155 0.112	Whiffs of chloroform.
7	Mother Fetus	I	0.142 0.106	Whiffs of chloroform.
8	Mother Fetus	I	0.155 0.124	Whiffs of chloroform.
9	Mother Fetus	II	0.126 0.11	No anaesthesia.
10	Mother Fetus	II	0.156 0.124	Whiffs of chloroform.
11	Mother Fetus	II	0.146 0.108	Whiffs of chloroform.
12	Mother Fetus	II	0.115 0.103	Whiffs of chloroform.
13	Mother Fetus	II	0.112 0.086	Whiffs of chloroform.
14	Mother Fetus	II	0.11 0.075	Whiffs of chloroform.
15	Mother Fetus	II	0.125 0.101	Whiffs of chloroform.
16	Mother Fetus	III	0.105 0.096	No anaesthesia.
17	Mother Fetus	III	0.126 0.105	Whiffs of chloroform.
18	Mother Fetus	IV	0.172 0.122	Whiffs of chloroform.
19	Mother Fetus	IV	0.124 0.095	Whiffs of chloroform.
20	Mother Fetus	IV	0.126 0.094	No anaesthesia.
21	Mother Fetus	V	0.132 0.112	Whiffs of chloroform.
22	Mother Fetus	V	0.126 0.13	No anaesthesia.
23	Mother Fetus	VI	0.089 0.06	Whiffs of chloroform.
24	Mother Fetus	VII	0.185 0.185	Whiffs of chloroform.

*Analyses made by W. H. Gross.

FATS AND LIPOIDS

From a long series of observations we obtained analytical results of a constant character which is illustrated by the cases in the table. The fats and lipoids are more abundant in the maternal blood and relatively large maternal values have large fetal values associated with them; otherwise, the most notable feature of our findings is the disparity between the quantities of fat and lipoids in the two circulations, and beyond this fact no constant relationship is observed. In the plasma the disparity is equally obvious. It is so great a difference that we may not entertain the possibility of fat passing through the placenta in a way comparable with that found applicable to other substances. For such results two alternatives come to mind: either the fats and lipoids cross the placenta with the aid of an enzyme, or they do not cross at all. Although our data would accord with either explanation, leaving the question open, there are at hand observations of a very different kind which decide the matter and teach that the latter interpretation is correct.

FATS AND LIPOIDS*

WHOLE BLOOD

NO.	SOURCE	CHOLESTEROL				LECITHIN	REMARKS
		FATS	TOTAL	ESTERS	FREE		
1	Mother	1120	280	115	165	350	Whiffs of chloroform
	Fetus	790	170	20	150	260	
2	Mother	885	255	110	145	355	Whiffs of chloroform
	Fetus	675	160	35	125	250	
3	Mother	940	225	145	80	245	Whiffs of chloroform
	Fetus	775	125	25	100	175	

PLASMA

1	Mother	1240	300	180	120	270	Whiffs of chloroform
	Fetus	840	180	30	150	200	
2	Mother	945	260	160	100	280	Whiffs of chloroform
	Fetus	715	170	40	130	200	
3	Mother	960	260	180	80	240	Whiffs of chloroform
	Fetus	780	95	10	85	115	

*Analyses made by H. J. Stander.

Following a line of investigation which Hofbauer began, Mendel and Daniels resorted to vital staining and employed Sudan III, which colors fat red. The animals used, pregnant rats, were treated by injection of the dye into the maternal circulation. Invariably, as these investigators find, the maternal fat is stained, but not the fetal. Between the tissue affected and that not affected by the dye the line

of demarcation in the region of the placenta is very sharp. Stained fat cannot be traced in transit through the organ, and there is no staining of the fetal fat. Now, these observations, especially in conjunction with the disparity we find between the amount of fat in the blood and of the mother and that of the fetus demonstrate that fat is not included among the materials contributed by the parental to the new organism. The fat in the body of the fetus is manufactured there, and, almost certainly, manufactured from carbohydrate. This view harmonizes with the arrangements made for supplying the fetus abundantly with glucose, for the maternal blood-sugar, you will recall, encounters no obstruction in the placenta as it passes toward the fetus. A variety of facts, therefore, support our conclusion that the fats and their derivatives, the lipoids, do not pass the placental partition, or, in other words, take no part in the placental interchange.

Without certain reservations, we may not infer that what has been found true for the placental interchange at full term is equally true for the early months of pregnancy, a time when the thickness and complexity of the wall of the chorionic villi are notably greater than at a later period. The simplification of the placental partition occurs at about the 18th or 20th week of pregnancy, and with it is associated the beginning of a more rapid rate of fetal growth. At least, during the latter half of pregnancy, the placental partition behaves as a semi-permeable membrane. Thus, the amino acids from which the fetal protein is built and glucose which supplies the requisite energy for tissue-construction, pass freely to the new organism. While in the mother's blood these substances are not more accessible to her own tissue than to those of the fetus; and, probably, the quantities which reach the new organism are regulated chiefly by the rapidity of their utilization in its tissues. Probably, the supply of water and of most, if not of all, the inorganic salts, including those of calcium, magnesium, sodium and potassium is regulated on the same basis. With regard to iron, at present it is impossible to affirm what arrangements are made for its transportation through the placenta. This fascinating but intricate and unsolved problem has a singular position among the factors of fetal nutrition. Stored in the newly born infant there are large quantities of iron so large that the quantity is proportionately greater than in the adult. The purpose of this storage, Bunge believes, is in the nature of a compensation for the inadequate amount of iron in human milk.

The fats and lipoids of the mother's blood, as we have seen, are held in check by the placenta, and the fetus manufactures these substances out of some other material, probably glucose contributed by the mother. The manifest difference between maternal and fetal blood in this respect stimulates our curiosity in regard to the fat-metabolism of pregnancy; and this is further aroused by current interest everywhere in the nutritional rôle of cholesterol and lecithin. The purpose and fate of these lipoids, physiologists have not made out satisfactorily, even with regard to animal metabolism in general. But, tempting as speculation is, at the moment we may go no further than the facts of a high fat-content in the blood of the pregnant woman and a much lower one in the blood of the fetus.

All the fetal waste-products, including carbon dioxide, which was the first to be thoroughly studied, pass through the placenta in accord with the laws of diffusion. Active elimination of these substances on the part of the mother's excretory organs maintains their proper concentration in her blood, and along with this proceeds a steady purification of the blood of the fetus. Less favourable conditions prevail in cases of nephritis and of organic cardiac disease, when an unusually large amount of excretory products appears in the mother's blood and simultaneously, as we have found, in the blood of the fetus. It is not unlikely, therefore, that intrauterine death in the presence of these maternal complications may be explained on the basis of inefficient removal of fetal waste.

In the final analysis, the nutrition of the fetus involves two factors, namely, the peculiar activity of its own organs, and the supply of food they receive. The first is the more fascinating, and also the more difficult of study, because the isolation of the fetus baffles the most ingenious experimenters. In the absence of specific knowledge regarding the intermediary fetal metabolism, our nearest approach to the facts is to accept its analogy with adult nutritional processes. And yet in doing so we are conscious of not being logical, for the unusual prominence of certain organs, as the thymus gland, intimates the existence of radical differences between the metabolism of the immature organism and that of the adult.

The second factor dealing with the origin and the variety of materials incorporated in its body has been brought within the range of direct observation, and certain familiar deductions therefrom have a practical application. Thus, there is no diet specifically adapted to the state of pregnancy; the prospective mother may exercise the same freedom as any one else in the selection of food. She should, however, choose what will agree with her and avoid that which she cannot digest and assimilate. Personal experience in the main must guide every one as to what to eat, and most women follow the dictates of appetite after they become pregnant as safely as they did before.

In a practical sense the quantity of the mother's food is more influential than its quality. Popular opinion holds that during pregnancy the mother "should eat for two." This doctrine is erroneous. A diet which has previously been ample will likewise be sufficient throughout pregnancy. And it is not unimportant to emphasize this view, which has the unqualified support of painstaking, scientific investigations, because overeating during pregnancy is much more likely to provoke discomfort than insufficient nourishment. On the other hand, there can be no justification for measures intended to restrict the growth of the fetus, for when rigidly carried out they tend to weaken the mother. She may be careful, in other words, to avoid overgrowth of the fetus, but should not adopt a diet so limited as to interfere with normal development. So long as her health is properly maintained no thought may be given as to what the size of the fetus is likely to be. At present, provided the physician determines by a thorough preliminary examination the existence of any disproportion between the size of the fetus and the capacity of the

mother's pelvis, he is qualified to decide what the appropriate treatment should be in order to bring pregnancy to a successful termination.

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PNEUMONIA AT BASE HOSPITAL M.D. No. 2, TORONTO, CANADA*

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We have all read and heard of the reports of the Pandemic of Influenza and Pneumonia from the Army Camps of the United States and England and France since the Fall of 1918, while practically nothing has been said of those in our own country, so that when our Secretary asked me to prepare a paper on Pneumonia, I thought that this Society might not object to listen for a few minutes to what actually happened at Base Hospital M. D. No. 2, Toronto, during the Epidemic of September and October 1918.

There has been a good deal of criticism of the building, but the results obtained compare favourably with any other military or civilian Hospital on the continent.

Base Hospital M. D. No. 2 was in the centre of the Military District which mobilized the largest number of troops of all branches in the great war, and while I have not access to the records, probably cared for more sick until that time, than any other military institution in Canada.

About the middle of September, 1918, there were 10,076 troops located in various camps in and about Toronto and these camps used the Base Hospital at that time for medical cases.

During the month of August there was an outbreak at the Polish Camp, Niagara-on-the-Lake, which assumed an alarming aspect because of the complicating Pneumonia incidence and subsequent death rate. At practically the same time we learned of the outbreaks in the American Army Camps.

Yet we did not look on the prospect of an invasion seriously, in fact the disease was scarcely recognized at that time as influenza and while we were in some measure prepared for an influx of cases, yet not for the avalanche which followed.

On September the 20th a few patients having the symptoms of a coryza filtered in. No more than the usual attention was paid to them. On Sept. 23rd 8 cases were admitted. These had a striking similarity in symptomology: headache, malaise, coryza, lacrymation, conjunctival infection, but no sore throat. Pulse 68 to 100; temperature as a rule not above 101; respirations 18-24;—in fact, the history of most of the cases during the early days at least could well be taken with a rubber stamp. From Sept. 23rd to 26th inclusive, 47 cases of Influenza were admitted.

I had the privilege of examining all of these patients during that time and in 9 cases a definite diagnosis of Broncho-Pneumonia was made, the diagnosis being based in three instances in the finding of a small area not much larger

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than a silver dollar near the angle of the scapula, showing Bronchial Breathing with bursts of fine rales; in others, of sustained high temperature, bloody sputum, areas of impaired resonance over part (usually lower lobe) of the lungs, Broncho-Vesicular or suppressed respiratory murmur. Not one of these early patients succumbed.

Now, as to the provisions made for the reception and care of these patients. At this time there were 175 general medical cases in the hospital. These were segregated and isolated with a staff also isolated except that they mingled with the others at Mess and during recreation hours. It is a significant fact that only six contracted influenza and none died.

Special wards were assigned to ordinary influenza cases and as soon as a diagnosis of Pneumonia was made they were transferred to wards set aside for that purpose. On convalescence they were again transferred to suitable wards. Doctors, nurses and attendants wore masks. The cubicle system was not used. Well ventilated, bright wards and outdoor balconies were utilized for pneumonia cases and it is my belief that patients in wards well ventilated and bright did better than those on balconies. I think an equable temperature such as can be maintained in a well ventilated sick room to be more conducive to recovery from pneumonia than changes of temperature such as we are liable to have in outdoor treatment.

The peak load of admissions occurred on Oct. 3rd, 146 being admitted that day, gradually declining until Oct. 28th when there were none and only a few after that time.

Up to and including October the 8th there had been 1170 cases of influenza or with the complication of pneumonia admitted to the hospital without a single death. This included every type from the slightly ill to the apparently moribund. Here we have a period of 15 days in which there were 1170 admissions and no deaths. We were commencing to congratulate ourselves. The following days, however, told a different story. On October 9th there was one death and Oct. 12th 9 deaths. Total of influenza cases 1761 with 5.17 p.c. deaths.

Total pneumonia cases 247 with 91 deaths or 36.84 p.c. We consider that the cause of death in each case was a pneumonia. Fourteen per cent. of influenza cases either subsequently developed pneumonia or were admitted with that complication. The greatest number of pneumonia cases at one time was 133. Of those that died the average length of illness was 8.67 days and in 75 out of 91 cases, 8 days or less and the greatest mortality occurred on the 5th or 6th days of illness. We did not consider that cross infection played any or any more than a slight part in the illness of the men.

Out of 35 civilian nurses employed 9 contracted influenza, with no deaths. There were 13 nursing sisters affected out of approximately 50, with no deaths and only one case of pneumonia. Only 2 Medical Officers, and these, strange to say, had the least to do with the patients, went down. One had a mild pneumonia. Non-commissioned officers and men numbered 250, of whom only 7 or 8 went

sick. A treatment parade was held twice daily when noses and throats were sprayed with Seiler's Solution, Prophylactic inoculation with mixed Influenzal Vaccine was performed on 25 of the personnel but was begun so late in the epidemic that we could not say anything of its value.

You are all thoroughly conversant with the various signs and symptoms of Influenza and Pneumonia and the variability in the severity of the infection. We do not record anything different in a general way. There were a few outstanding clinical features, however, which I would like to touch upon.

RESPIRATORY SYSTEM

The respiratory rate was not greatly increased except in the later stages of pneumonia with pulse following approximately the same curve. Epistaxis was only fairly frequent. Cough was extremely severe, unproductive in early stages, irritable and exceedingly difficult to control. The character of the sputum varied—"frothy," "glairy," "mucoid nummular," "muco purulent," "blood streaked," "prune-juice" are typical modifying terms taken from case history sheets. There were three cases of typical prune-juice sputum, all of which proceeded to a rapidly fatal termination.

The exact point of intervention of a pneumonic process was exceedingly difficult to determine, but an elevation of temperature continued over 3 days, slight rise in pulse rate, possibly blood-stained sputum, the finding of areas of suppressed breathing or small areas of consolidation with characteristic signs and too, the appearance of the patient—all of these factors were indicative of the onset of pneumonia.

The rapidity of the spread of the pneumonic process was astonishing, a patient showing but a small involvement, and having a good prognosis, might in twelve hours have the lungs widely involved with a hopeless outlook as to recovery. All stout men did poorly.

We encountered one case of pneumo-thorax. In three cases of Phthisis, one died, the others doing well.

A severe pleuritis was very frequently present and practically every case having a diaphragmatic pleurisy died. I do not recall one who recovered. Severe pleurisy was usually the forerunner of an effusion of which we had twenty cases at least, two involving both pleural sacs. Seventeen developed Empyema. As we were instructed to send these to the surgical wards at the Toronto General Hospital, we could not follow them further.

Our experience showed that those who were aspirated until the acute pneumonic process subsided and then were operated upon, did much better than if thoracotomy was performed immediately on the finding of pus, irrespective of the stage of the pneumonia.

CIRCULATORY SYSTEM

Cyanosis was a constant feature. Pulse comparatively slow, easily compressible, rate increasing as disease progressed. S. B. P. 110, D. B. P. as low

as 40-20. Only in a few cases was right heart dilatation demonstrable. Purpura was frequently present and capillary paralysis occurred early giving a very unfavourable prognosis, there were 3 cases of pericarditis, no effusion being demonstrable. There were no instances of Phlebitis.

BLOOD COUNT

Lowest recorded 4000. Many cases of pneumonia showed a count of not more than 6000, a rise indicating some complication such as Meningitis or abscess formation. One case of Lobar Pneumonia had a count of 40,000 white cells. Blood cultures were negative. The spleen was rarely palpable.

DIGESTIVE SYSTEM

A dirty "typhoid" tongue with a foul mouth, was an almost constant feature. I think the non-occurrence of parotitis is a tribute to the nursing attention these men received.

Epigastric pain was fairly constant. There was one case of diarrhoea. In four cases showing jaundice all died. Abdominal distension was frequent. There was no appendicitis.

GENITO URINARY

In severe cases Albumin Casts and Leucocytes were practically constantly found. There was occasionally Hematuria. Three had retention but no suppression.

SPECIAL SENSES

Acute Otitis Media was fairly frequent, none going on to Mastoid Abscess. Conjunctivitis was frequently observed with one case of pus formation and five cases which we diagnosed as Brain Abscess.

CUTICULAR

A Sudaminal rash was seen in 6 cases. Jaundice, cyanosis of back and chest, a livid ashy hue were frequently noticed. Taché cerebral was marked and we occasionally noted the formation of small abscesses.

JOINTS & MUSCLES

Arthritis was occasionally seen. There was inability to use left arm in two instances. One patient had an acute arthritis of left sterno clavicular joint. Two cases of rheumatic fever lighted up during convalescence and muscular weakness was a frequent complaint.

NERVOUS SYSTEM

Sleeplessness apparently of a toxic origin was noticeably present but not any more difficult to treat than in other pneumonias. Delirium was very frequent

and while ordinarily mild, in quite a number of cases was very violent, particularly where two or more were in one ward. Abolition of reflexes was common in the later stages of pneumonia. Two cases showed convulsions, both dying. One case was complicated by pneumococcic meningitis and four showed meningeal symptoms.

TREATMENT

As far as the treatment of influenza and the complicating pneumonia is concerned we found no royal road. To get the patient to bed in a quiet place with good ventilation was the first objective. After that, good nursing attention which was all important and symptomatic treatment were followed. We were indeed forced to run the gamut in an endeavour to secure results and considered ourselves fortunate if we were able to keep our patients comfortable.

A sitting posture obtained to a greater or less degree by the use of Gatch frames, was very beneficial. Light pneumonia jackets were used, emphasis on *light*, for I cannot see the virtue in hindering elimination by the skin over such an extensive area as the chest.

As much food as a patient could handle, frequently irrespective of temperature, was administered, as we found that often a continued temperature would fall on an increase in the food intake. Quinine grs. III, acetyl salicylic acid grs. V, were given to the early influenza cases as a routine and we thought good results were obtained; but the value of quinine is doubtful in this type of disease showing as it does, such a low leucocyte count. Quinine Hydrochloride and Quinine & Urea Hydrochloride were used in many cases of pneumonia. Whiskey in doses of $\frac{1}{2}$ oz. every four hours was given to pneumonia cases. It frequently excited vomiting and it was our impression that it did no good. All cases with an alcoholic history did poorly. Champagne was certainly less irritable and allayed vomiting.

For cough and expectoration the two most effective expectorants were Ammonium Chloride, and Potassium Iodide, with appropriate sedatives as required. Inhalations of volatile oils were of some value. The new B. P. Tincture *Strophanthus* mins. 5 q.4.h. was used in a number of cases. Its value was doubtful. The early exhibition of *Digitalis* we believe assists the heart in the later critical period. As further stimulants Camphor in Oil, Caffeine, Sodium Benzoate, Pitutrin, Strychnine, Atropine, *Strophanthus* intravenously, and ether subcutaneously were all used. We cannot say that Oxygen was of any great benefit. Venesection was of no permanent aid and did not appear to act as it does in types of ordinary pneumonia in tiding over a crisis. Nothing in particular can be said as to the effectiveness of sedatives and hypnotics. We used them all and must say that Morphine was by far the most reliable and satisfactory. Paraldehyde is deserving of mention and in one or two instances a hypo of H.M.C. worked like a charm.

Medicinal treatment proved to be almost wholly symptomatic and it taxed our resources to the limit. The introduction of Saline or Glucose and tap water per rectum we think was of great value, even more so than Saline intravenously.

Type I Pneumococcic Serum was used to advantage where that type of organism was isolated but was of little or no value where other types were the prevailing organisms present. In three instances blood transfusion was performed; one died after a rather long illness. The one method of treatment which gave most promise of success and very good results was begun when the epidemic was at its height and I believe the Base Hospital was the first place in Canada to use it. I refer to the use of Convalescent Serum.

Capt. Dale, who did most of the work in this line, has kindly given me the following statistics:—

Early Cases.

All severe showing mostly intense cyanosis and toxæmia. Serum given within 24 hours of detection of pneumonia. These cases were average Flu pneumonia cases.

Cases 30.....Deaths 0.....% Recovery 100.

Late Cases.

All serious and varying from 2-3 days from onset pneumonia which affected both lungs. All cyanosed with rapid weak pulse.

Cases 38.....Deaths 10.....% Recovery 74.

Very Late (Hopeless Cases).

The initial cases treated mostly moribund at outset. These I feel sure would none have recovered without serum.

Cases 26.....Deaths 22.....% Recovery 15.

Total Cases 94.....Deaths 22.....% Recovery 65.

If the very late series were excluded the mortality would be approximately 15%.

It is apparent that the earlier the serum is given the better the chances of the patient.

Not sufficient attention was paid to the epidemic from a laboratory standpoint, due chiefly to lack of assistants and as a result, our data is scarcely comprehensive enough to warrant any conclusions.

Fifty per cent. of those typed were of Type II and the remainder divided almost equally amongst the other types.

From the post mortem side of the problem, I regret to say we have nothing to report. A hostile public opinion was responsible for our inability to obtain consent to any post mortems and we realize that a great deal was lost to us on that account.

Through the kindness of the Toronto General Hospital, however, I have secured the following extracts from Autopsy records which show the predominant findings of a Hæmorrhagic condition of the lungs. "Bronchi markedly con-

gested," "Towards smaller tubes there is definite pus," "Areas of yellowish consolidation alternating with deep air holding tissues."

Lower Lobe: "Consolidated and œdematous, except apex." "Dark Color," "Fibrinous deposit on surface."

Section: Upper lobe shows uneven congestion; lower lobe deeply congested; consolidated areas rather moist; mucosa congested.

Section: Irregular areas of consolidation greyish pink alternating with small abscesses, with areas of very dark red. From cut surfaces a seropurulent fluid is scraped.

Section: Lobular areas of consolidation; in centre of one of these is an abscess.

The Pneumococcus, Staphylococcus and non-Hæmolytic Streptococcus in that order were the prevailing organisms found.

For the purpose of comparison, the following Table may be of interest. It is taken from the report of the Division of Infectious Diseases and Laboratories, Medical Department U.S.A.*

Camp	Cases of Influenza	Cases of Pneumon.	Total Deaths	Percent attacked by Influenza	Percent of Pneumonia to Influenza	Percent of deaths from Pneumonia	Duration of epidemic in days
Logan	3137.	393.	16.	24.6.	12.4.	3.8.	41.
Travis	8470.	1742.	168.	24.7.	20.5.	9.0.	30.
Lewis	3141.	994.	148.	9.7.	31.6.	14.8.	33.
Kearney	2450.	186.	37.	13.5.	7.9.	19.8.	34.
Sheridan	4758.	521.	132.	20.4.	10.3.	24.6.	28.
Taylor	11587.	2800.	830.	19.2.	24.2.	29.0.	39.
Devens	13398.	2288.	794.	30.1.	17.1.	34.9.	49.
Johnston	2117.	383.	161.	11.1.	18.2.	40.9.	30.
Grant	10717.	2335.	1068.	25.8.	21.8.	45.7.	39.
Sherman	4789.	1717.	1058.	13.5.	35.7.	61.3.	32.
Greenleaf	4747.	343.	263.	20.3.	7.2.	75.2.	20.
Bowie	4052.	119.	104.	38.1.	2.9.	89.8.	32.
Base Hospital . .	1761.	247.	91.	17.5.	14.	36.84.	37.

Two features stand out prominently in our experience.

First—The exceedingly small number of the personnel affected, for which we have no particular reason unless it be the daily spraying of nose and throat.

Second—The really brilliant results obtained in many cases with convalescent serum.

NOTATIONS—

During the time of the epidemic we had the benefit of the valuable assistance and advice of Lieut.-Col. C. S. McVicar and Major W. B. Thistle. Consultants to the Hospital.

*"The Pandemic in the Army Camps (George S. Soper, Ph.D., M.D., Major S.C., U.S. Army, Washington, D.C.)

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**ANNUAL ADDRESS OF PRESIDENT ONTARIO MEDICAL ASSOCIATION
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G. STEWART CAMERON, M.D., PETERBORO.

It falls to my lot as President of the Ontario Medical Association to deliver the Annual Address, and before attempting to discuss some of the questions which are before our profession to-day, I desire first of all to extend to you my sincere thanks for the honour which was conferred upon me, and in the second place to thank the gentlemen of the Executive and of the various Committees for their willingness to assist in carrying on the work of the Association. In particular I wish to thank the members of the Committee on Legislation, and especially the Secretary, Dr. John Ferguson, to whose untiring efforts the success of our Report on Medical Education was in a large measure due. To those gentlemen who have come from overseas, and from the Republic to the South, to assist in our programme, we extend our warmest greetings and gladly welcome them to our Convention. May we hope that their presence with us symbolizes that unity which should exist among the various branches of the Anglo-Saxon race.

You have been called together to take part in the Thirty-ninth Annual Meeting of this Association, and as the Executive head, it gives me great pleasure to-night to welcome you all, and to hope that in the varied programme which will be presented each one may find something to interest and to instruct, so that on your return to your several duties you may carry with you something helpful in solving the daily problems which present themselves and that you may retain many pleasant memories of the Association with your friends of former days.

We are permitted to meet this year under conditions quite different from those prevailing during the past four years and a half. Since our last Peace Meeting in 1914, great changes have been wrought in the world. Little did any of us believe when we read of the murder of the Austrian Archduke and Duchess at Sarajevo that this was to be the beginning of a struggle that would ultimately involve, as active participants, nearly all the countries of the world, and that nations whose social structure was looked upon as reasonably secure, and others who prided themselves in having evolved a system of government and a masterly efficiency second to none in the world, should be so rent asunder that life and property, the church, art and all the refinements which we in Anglo-Saxon lands hold so dear should be trampled in the dust by a proletariat made mad by the lust of power and possession. New nations with new forms of government have sprung into existence throughout middle and eastern Europe and the geography of that part of the world must be re-studied if we wish to become conversant with the many changes that have taken place.

In our own Empire we have witnessed mighty changes. On that memorable fourth of August, 1914, when the Government of Great Britain determined to back up her word in Treaty pledged by force of arms, there came as if by magic from all quarters of the Empire, assurance of loyalty, co-operation and support to the uttermost and from that moment up to the present, the determination of Great Britain and her Dominions to see the triumph of righteousness throughout the world has never faltered. Steadfastly has she kept faith with her Allies, during the many trying months of disastrous warfare, and in the face of an incessant propaganda sown by the enemy for the purpose of creating discord among the allied nations. We have seen her Army grown from that small but glorious company of "Contemptibles," first, by voluntary enlistment, and later on, as the cry for men became greater, by compulsory service until at the end of the war over seven million men had been recruited into Military Service. Behind this we saw a nation to some extent resting upon its laurels gained in other days, transformed into a huge workshop of splendid efficiency. The social barriers gave way and men and women of all classes and creeds worked side by side in the great munition plants, shipyards, weaving mills and other immense war organizations. Here let it be said to the everlasting credit of the laborer and worker of Great Britain that in the hour of his country's need he stood squarely behind his co-worker in the trenches determined to see militarism and its attendant evils destroyed forever and truth and right living, international honour and integrity permanently established. This action of the British workmen goes far to convince us that while there may be unrest during the transition period from war to peace, he will never permit his country to be submerged by the violent and murderous doctrine of Bolshevism.

All this is something that is of interest to everyone, but out of this marvelous four years of superhuman effort the great medical organizations of the army and of civil life naturally appeal to us in a special way. The success of the gathering together of thousands upon thousands of men from all walks of life depended, in a large measure, upon the effective selection of recruits and then upon the careful attention to their health during the period of training, and subsequently in the great bases, lines of communication and on the actual battle front. Beginning with a small organization there grew up one of the most effective systems for dealing with the tens of thousands of casualties that occurred. When we consider that the vast majority of the medical officers were gathered from the ranks of the civil profession in all parts of the Empire, with little or no knowledge of military service, we may be pardoned if our hearts swell with pride at the very splendid manner in which their work was done. Great questions in preventive medicine, hygiene and sanitation had to be solved, and it is to the credit of our profession that we were able to produce scores of men who, working in conjunction with other departments of the army, were able to solve these questions and thus permit the military leaders to place in the field soldiers physically fit and to keep them there with the minimum of disease. On the other hand the splendid service rendered by the hospitals, the physicians and surgeons, the nurses and the

orderlies, must ever remain one of the bright chapters in the history of medical science. Heretofore we have seen things done, relatively speaking, in a small way, but the war compelled us to do things medically in a gigantic way. Fractures of different kinds were gathered together by the hundred in special hospitals. Wounds of the head, of the chest, or of special organs were grouped together in large numbers so that they might receive the very best attention which surgeons, specially qualified in these varied departments, might be able to give. All this has resulted in returning to efficient civil life tens of thousands of men who otherwise would have become dependent upon the bounty of the State. Furthermore, it has given to medical science many valuable ideas which, if properly applied, will be of incalculable benefit in civil life.

In the convalescent hospitals, both in the old land and in Canada, we have witnessed the remarkable development of physical and hydro-therapy. So much did these therapeutic measures impress Mr. Justice Hodgins, the Government Commissioner, that in his recent Report he strongly recommended a Department should at once be created in our medical faculties. Further, our teaching hospitals particularly should be equipped so that students in medicine could be thoroughly trained in all these methods.

It is with justifiable pride that we, as Canadian physicians, look back over the past four years at what has been accomplished, knowing that throughout it all we have borne our part. In the glory of victory, not only over the enemy encountered in the field, but over many of those insidious foes, that in past wars have taken greater toll than the enemy, Canadian medical officers have shared in the triumph, and to-night, on behalf of this Association, it is my great privilege to extend to all those men who have returned or who will return, the greetings of the medical profession of this Province, and to say to you gentlemen, that we are proud of your achievements and gladly welcome you home, believing, that the knowledge you have gained, the rich experience which has been yours will immeasurably add to the profession in our homeland.

Alas! with all this glory there must come inevitable pain, for among the more than two thousand medical officers who left Canadian shores, many will not return. Cheerfully they gave up their work here and went forth to do whatever fell to their lot in the care of their fellowmen, and whether through disease or by the weapon of the enemy they made the supreme sacrifice,—we know they gave their lives in the performance of a duty which was entirely a service to others, and we bow our heads in token of respect to their memory. It seems to me that the medical profession of this Province has now an opportunity of raising up a memorial to these departed members, that may be passed down to generations to come. I would, therefore, suggest that this Association appoint a representative Committee to take up the matter of raising sufficient funds to create an endowment, the interest of which should go to provide a scholarship to be known as the Ontario Medical Association Scholarship to be applied to research in some part of the medical field. Let me say, Gentlemen, that the duty is ours, that the opportunity is here, and let

it not be said of us that we were neglectful of our duty or indifferent to our opportunity.

Before leaving this subject, may I be permitted to say one word in behalf of those men who have carried on at home. Many medical men who for one reason or another, were unable to go overseas, did splendid service in Canada, for upon their shoulders rested the responsibility of doing the work here, and while their contribution in no way compares with that of those who accepted the greater responsibility, yet we feel that we should not fail to recognize the good service they have rendered.

Now that the war is over we must turn our attention to the various peace problems. In the world at large many old traditions and ideas have been abandoned, and their places have been taken by new and in many cases untried ones. The balance of power among the nations is giving way to the hitherto Utopian idea of a League of Nations, wherein the countries of the world will seek to live together in peace and harmony. In the domain of medicine, things almost as revolutionary have taken place, and it will be to our advantage to study the new conditions which have arisen, and to place ourselves in a proper receptive attitude towards them.

For most of us the character of practice will be somewhat altered as a result of the return to civilian life of so many soldiers who have been casualties. As these men, either temporarily or permanently disabled, gradually scatter to their various homes through the country they will come under the care of the general practitioner. Injuries of bones and joints and of muscles and nerves will be fairly common. The care of amputation stumps, and the adjustment of artificial limbs will demand a good deal of attention. On the more purely medical side there will be those disabilities such as nephritis and the pulmonary results of the various gas poisons. Added to this, there is bound to be much wider spread of venereal diseases, and for some time to come we will have a goodly number of men suffering from the effects of the various mental and nervous disorders resulting from the conflict. To give the best service to these men we must become conversant with the best forms of treatment adapted to these cases, and, as the Government has assumed the responsibility for the care of all returned casualties, I presume they will demand a proper efficiency on the part of the profession. Might we suggest, therefore, that medical men accept every opportunity presented of obtaining a good working knowledge of this new type of practice.

In this connection, I think it a most commendable idea on the part of the Director of Medical Services when he suggested through the O. C. of the Dominion Orthopædic Hospital, the advisability of the members of our Association paying a visit to that splendid institution, and seeing at first hand the work being carried on therein. Would it not be possible to go a step farther and suggest to the military authorities that these various institutions throughout the country be made centres where clinical instruction could be given to classes of graduates? This would have a two-fold bearing. The members of the profession who availed themselves

at these classes would get a good insight into the more modern therapeutic devices in medicine and surgery, and on the other hand the military authorities and the Pension Board would have a better trained profession to minister to the disabled soldier.

This naturally brings to our minds the subject of General Post Graduate training, and now that the war is past we believe one of the first questions which should interest our profession, and particularly the teaching bodies, is that of developing proper facilities for the instruction of graduates. Previous to 1914 many of our men, to increase their store of medical knowledge, went to Europe, Great Britain or the United States. For apparent reasons this is all changed, and for many years to come the Continent of Europe will not be the medical mecca it has been in the past. I know I am voicing the feelings of a great many of our profession when I say that we must develop within ourselves facilities for Post Graduate instruction. The large clinical centres of the United States are always available for those who have the time and inclination to go abroad, but there are hundreds of men practicing in the rural sections of our Province who find great difficulty in leaving their fields, but who at the time should have some close-at-hand means of receiving instruction in modern clinical methods.

The time has arrived when our Universities should seriously consider this matter, and try to formulate some scheme whereby the graduate, after he has successfully completed his training with faculty, could be kept, as it were, under observation. The Department of Medicine should be so organized and directed that there could be constant co-operation between the man in the field and the parent body. Whether this should be carried on by the same instructors is a question for study. In this Province the public has spent and is spending large sums of money equipping hospitals and laboratories wherein men are trained in the very best methods of preventing and of treating disease. To this extent at least they are directly interested in the training of competent physicians. In consequence have they not a right to expect that this standard should be maintained throughout the physician's years of practice? It is surprising that in some quarters we find the suggestion advanced that men in practice should be examined at stated intervals to determine whether they are keeping up to a proper standard of efficiency. We believe that this would be quite unnecessary if thorough modern Graduate instruction was inaugurated, and its advantages and attractions thoroughly and constantly kept before the profession. In addition your Association is making an effort to raise the standard of work in our profession by introducing through local medical societies a system of Post Graduate Medical Study. A Committee was appointed some time ago to consider this matter, and I am glad to say that success has attended our efforts to such an extent that we hope to be able very shortly to offer any local or county society a syllabus of lectures together with a list of medical men who will be available to give them, and I would strongly recommend every Association to investigate our plans and arrange where possible to adopt them for the coming Autumn and Winter.

Through our journals and the medical and surgical literature of the war, we have learned a great deal about the brilliant work done by our surgeons and internists, but not so much about what was done to keep our troops in good physical condition, and prevent those decimating epidemics which in all previous wars have been a greater menace than the guns of the enemy. We have on the one hand the splendid work of our engineers in conjunction with the sanitary corps giving to our armies a constant supply of pure water for drinking purposes, and providing adequate sanitary arrangements. On the other hand through the compulsory use of serums and vaccines the horrors of smallpox, tetanus, enteric and allied fevers were practically eliminated. If it were possible among the millions of soldiers to reduce infectious diseases almost to the vanishing point, and if through proper medical supervision and adequate sanitary and hygienic conditions it has been possible to build up a strong physical manhood, should application be made of this when we come to consider civil life? The whole field of medicine as you are aware maybe, broadly speaking, divided into two parts, the prevention of disease, and the treatment of disease. As we said a moment ago, much has been said about the treatment, but comparatively little about the prevention. We believe, however, that if the army's experience is fully made use of among the civil population preventive medicine and its resultant Public Health, will receive a very great impetus. While a great many of the beneficent aids in the prevention of sickness have come from our laboratories the organization and development of National Public Health movements must necessarily go beyond the bounds of our profession and find helpers among all classes of the laity.

It is with pleasure that we note that a Department of Public Health has been created by the Federal Government, and we sincerely hope it will be launched well equipped with suitable laboratories, and thoroughly competent men to conduct the work. Ample funds must be freely supplied for the maintenance of all its activities and it should be absolutely free from any political control. We would like to suggest that the Government provide a certain number of Fellowships to be open to the graduates in medicine from our various Universities. We trust that this is but the beginning of a much wider interest in matters of Public Health by the Dominion Government and that the many lessons learned as a result of the war will be promptly and efficiently applied to peace conditions. In the matter of venereal diseases, the army has been largely responsible for placing certain facts before the public and we believe that the public desires to see sane action taken by the Government. The Federal Authorities in assuming the treatment of the returned soldier will, we suppose, not relax their vigilance regarding social diseases among them. A matter that might well be referred to the Federal Health Department for investigation is the result of the examination of recruits under the Military Service Act. Out of 361,695 men examined, 181,255 were found to be lower than Category A, or in other words a little over fifty per cent. of the men examined were defective in some way, and let me say that in many cases this result was apparent in sections where the large bulk of the population was native born, so that

the cause could not be the result of indifferent immigration. I am quite sure you will agree with me that these percentages are altogether too high for a young virile country such as Canada. Having learned these facts, are we as a nation to sit idly by and permit a continuance of this decadency? All will emphatically say no, and the public, being in possession of this information, will naturally look to us to take the lead in solving the question. Many of the defects were undoubtedly due to accidents and injuries received during adolescence, but even after eliminating all cases of this kind, we still have a large percentage that were due to preventable causes. In order that this may not be repeated in succeeding generations, our profession should do all in its power through properly organized clinics, supervised instruction and ethical propaganda to secure healthful prenatal conditions for the mothers of our land, modern obstetrical attendance and nursing during their puerperium and the best of food and modern hygienic conditions generally, both for the mother and child, during the succeeding months. It is unfortunately too true that our advent into this world is still surrounded by too much superstition, and I am sorry to say carelessness, arising from ignorance. In the Garden of Eden it may have been a physiological event, but under our modern conditions of life it is beset by many pitfalls.

The subject of Under Graduate instruction has been receiving attention from our medical faculties, but up to the present time we have not heard the results of their deliberations. We suppose there cannot be much difference of opinion with respect to the primary studies. Anatomy and physiology, with the co-related subjects, must naturally receive very thorough and comprehensive study, for upon these subjects must always rest the superstructure of the student's medical education. When we come to consider the training in the final years, differences of opinion are more likely to arise.

The rapid development of medical science renders it impossible for any one man to become proficient in all departments, hence the reason for specialization. We think that the time is at hand when consideration will have to be given to the separation of medicine from surgery, and in creating a separate department of Public Health. If medical education is to develop along these lines, the final year of study should have optional courses, so that a man after receiving a good general knowledge of medicine might concentrate his efforts along congenial lines, and more thoroughly fit himself for the particular work in which he is to engage. If this were done we think the degree of M.B. should be conferred upon graduates as a mark of general proficiency, and when a man has completed the work in his particular department, the degree of that section should be given to him, thus indicating that he is particularly qualified in medicine or surgery or whatever his special branch may be. In this way the public would gradually come to recognize these qualifications and the holders thereof would receive a recognition which they do not enjoy at the present time.

Increasing the time of study to six years and also by the greatly increased cost of living, a very valuable type of man will be eliminated from our student

rolls. I refer to those, who in former years gained their education by their own individual efforts, and in many instances were numbered among the brightest lights in our profession. To offset this might we suggest to some of our wealthy laymen that they emulate the example of Sir John Eaton, whose princely gifts to medical education rank him among our best benefactors on this continent, and provide Fellowships which would be of real assistance to our graduates and would at the same time tend to keep many valuable men at work in our own land in place of having them go elsewhere with our country losing their services.

It was disclosed in Commissioner Hodgins' Report that there was not complete harmony of opinion between some of our Universities and the College of Physicians and Surgeons regarding the jurisdiction over the examinations for license to practice. May we be permitted to express our regret at this and at the same time to say that we think it would not be in the best interests of the Universities or of the profession at large to have centralized in the Universities the power for which some of them are asking, and we are glad to see that Mr. Justice Hodgins expressed a similar view in his Report. There are many men outside of the medical faculties who from travel and practical experience are quite competent to give valuable advice on medical education, and we think it would be unfortunate if this opinion should be eliminated. Rather we think some plan should be devised whereby this opinion could be utilized.

Centres of medical activity are gradually developing in Ontario. If our population is to increase even as fast as some of our moderate prophets foretell, these centres will rapidly grow and become no mean factors in shaping the medical affairs of this Province. We would therefore suggest that in any legislation that may be forthcoming these facts be recognized and that the interests of the general profession be carefully guarded. At the present time the only official avenue through which we may give expression to our views is the College of Physicians and Surgeons, and while there may be a necessity for some reorganization of that body, we believe there is no real call for departing from the principle underlying its position with respect to medical education.

The most important problem before our profession in this Province to-day is the new Medical Legislation which is bound to appear in the near future. As you are all aware the report made by the Commissioner, Mr. Justice Hodgins, has been presented and the Committee of this Association, in conjunction with the College of Physicians and Surgeons, placed their views on the report before the Government last November, and it was generally understood at that time that legislation would be brought down at the Annual Session of the Legislature this past winter. For some cause this was not done, and so far as I am aware, no reason has been given by the government for the non-appearance of the proposed Bill. We do know, however, that very strong opposition to the Hodgins Report developed among the irregular practitioners of this Province, and it is possible that the government desires more information before embarking on this new legislation. We are inclined to think that a good many medical men do not realize the gravity

of the present situation. The Commissioner in his report very strongly upholds the general position taken by the profession, but when a government considers legislation it is naturally guided to a very considerable degree by public opinion, and I think we should stop for a moment and consider whether we have united public opinion behind us. Perhaps it may come as something of a shock to a good many doctors when we tell them that we doubt very much if a bill based on the findings of the Commissioner could be passed at the present time, for from the replies given by many members of the Legislature, when approached by representatives of this Association, we believe that such a bill would have a hazardous course in Queen's Park.

The practice of medicine to the lay mind is shrouded in mystery, and it is an astonishing fact that even among the educated classes they have little conception of what medical science is really doing. On the other hand there is arrayed against us very strong commercial interests and the whole body of irregulars, and these interests are seeking to create a public opinion strongly antagonistic to our profession. We find appeals being made to the poor man, the worker or the artisan, as the case may be, urging the government of the day to resist the encroachment of the medical profession. A glaring example of this was seen in the enactment regarding the public sale of medicine for the treatment of venereal troubles. Notwithstanding the fact that the bulk of the agitation for this needed reform came from the laity, the medical profession has been accused of being the instigator of this movement with the object of getting a monopoly of the treatment, and thus increasing their incomes. In the state of unrest that is abroad to-day, it is difficult for any one to forecast the effect which these propaganda will have. We believe that a great deal too little has been done in the past to bring the general public and the medical profession into closer contact. It is quite true that the personal relationship between patient and physician is often of the closest, and that many times he is the guide, philosopher and friend of his clientele. But notwithstanding these happy relationships it is yet a fact that a great mass of the public knows little about the profession as a whole, and the great fundamental principles upon which is based our modern conception of medicine. The result is that a great deal of the public's information had been received, in the earlier days, from the picturesque quack who stood on a box at the village corner and explained to an awed group of villagers the wonderful problems of disease and his still more wonderful remedies. More recently this educational work has been taken up in vigorous fashion by all sorts of patent medicine companies. Through the mail, the daily or weekly newspaper and the monthly magazine, they tell what benefactors they are to the human race, and in the various cults we have the ultra modern purveyors of medical knowledge. As a profession we should be brave enough to admit that important forces are opposed to us, and in place of treating the whole matter lightly, seek by legitimate propaganda to educate the public to a better understanding of some of the principles underlying modern medicine. It is quite true that this would be a departure from our traditions, but when the whole "world

is in the melting pot," we in our profession cannot hope to escape without some marked changes, and to my mind these will be the better for us if we try to direct the public mind to a truer conception of the scientific basis upon which we rest our diagnosis, prognosis and treatment.

A matter which I think requires no apology for bringing before you is that of State Medicine. As you all know there is a demand in some countries for Government or State control of the Medical Profession. In Canada, in one or two of the provinces, it has appeared as the beginning of a real issue. It is not my intention to-night to either approve or condemn. To do this intelligently we must be in possession of much more information than we at present have. Believing that it might become a live topic of interest to our profession in the future and desiring that you should be in possession of the best available information on the subject we appointed a committee, last autumn, to gather data and place it in your hands so that you might become conversant with all sides of the question. The re-arrangement between the employer and employee is to-day a very pressing question. The relationship of capital to labour is everywhere a predominating issue. We in Canada are not escaping this world-wide revolution, and it seems to me quite possible that a demand will be made that Medicine, to some extent at least, shall come under the control of the State. In the agitation that is going on among the masses of our people higher wages is not the only question. They are demanding, and rightly, too, better housing conditions, better hygienic and sanitary arrangements, more time for recreation, and better opportunities to enjoy their lives. Add to this the public opinion along similar lines that is bound to be created by our returned soldiers, and you have a force that will compel any government to give very earnest consideration to their demands. As a profession we cannot stand aloof from this great movement nor assume a spirit of indifference. There never was a time in the history of Canadian Medicine when we should watch more carefully the trend of public opinion and be prepared to assist in the direction of that opinion so that the very best results will accrue both to the public and to our profession.

The matter of school inspection is one of the subjects receiving increased attention at the present time. Too little attention has been paid in the past to the physical side of our children. It is only within recent years that any real attempt has been made to develop healthy manhood and womanhood in our schools. Our educational system has disclosed a mad race to pass examinations on schedule time. The robust in body and mind succeeded, while those of bright intellect but weakened bodies had to give up the contest or else fall by the wayside, physical misfits. On the other hand the child of fair physique but of slow development, has too often been the butt of his more fortunate classmates or of his instructor. We trust that in the change of view that is taking place among our educationists they insist that careful and thorough examination be made of all school children on their entrance to our public schools. That from time to time throughout their course they be submitted to further physical examination so that defects in de-

velopment may be detected and proper measures taken for their correction. In this way children weak, either physically or mentally, may be early detected, and proper plans made for their care. We believe that physical exercise, both in gymnasium and on the campus, under properly qualified instructors, should be part of the daily time-table in all our schools. To provide all this would entail much increased expenditure on the part of the State, but where can money be better invested than in building up men and women of strong body and mind? Surely this is the greatest asset any State can have, and we feel that the humblest dweller in the land has a right to expect our Government to provide facilities that will enable his child to get a square deal physically during the years of compulsory school attendance.

In the epidemic of influenza through which we have passed, the Medical Profession has been called upon to pay a heavy toll, and many of our numbers have made the supreme sacrifice as a result of arduous work and faithful attention to their suffering clients. At another time, and from another source, a fitting tribute will be paid to these past members of our profession; but there are two names that stand out so distinctly in my mind that I feel I cannot allow this occasion to pass without making some personal reference to them. I refer to the late Dr. Reeve of Toronto, and the late Dr. Norman Beal of London. The one had outlived the allotted span of three score years and ten, but even though his life was long it was not long enough to see the fulfilment of various projects that filled his busy mind. He was a man who had built up for himself a national reputation in his chosen field, and to such an extent had he gained the goodwill and respect of his confrères that in 1906 one of the most distinguished honors in Anglo-Saxon Medicine was conferred upon him, that of being made President of the British Medical Association. It is not necessary for me to dilate upon his life, suffice it to say that it was an ornament to Canadian medicine, and an inspiration to all those who knew him. Norman Beal was a member of the Executive of this Association up until a few weeks before his death, when he resigned that he might accept the position of first assistant to William Mayo at the Rochester Clinic. His life was cut off just on the threshold of what promised to be a brilliant surgical career. To those of us who knew him and had the pleasure of working with him, his memory will ever remain as the embodiment of that buoyant enthusiasm in his chosen profession which would go far to maintain in Canadian medicine the very best traditions of our science.

I cannot close these remarks without mentioning the splendid service rendered in the recent conflict by our nurses. They have braved the dangers of war on both land and sea, and many of them have given their lives in the service of their country. On behalf of our profession I take this opportunity of publicly recognizing the splendid work which they have accomplished. Those who are privileged to return to civil duty should form a very strong body in their profession, which no doubt will lend considerable influence in the direction of the affairs of their Association. There are some problems surrounding the question of nurses

in Canada which will soon require action, and I think I can say in so far as the medical profession is concerned, we would much prefer that they settle these themselves. Considerable discussion is going on at the present time with respect to the pay of nurses, their hours of duty, and also to the place of the experienced nurse. I think it is only reasonable to say that, with increased remuneration to the trained nurse, and shorter hours of duty, their clientele will become more circumscribed, and hence a wider field of usefulness will be opened for the experienced nurse. I am sure it is safe to say that almost every physician feels the necessity for the experienced nurse, and I am led to believe that this is in accord with the views of many of our trained nurses, but we would like to see the work organized in association with our present nursing system. We trust that in the discussion on this subject before the Canadian Nurses' Association, some scheme may be evolved whereby the practical nurse can be trained and controlled through, or in association with, our present nursing staffs.

In closing let me say to the members of our profession that a two-fold responsibility rests upon us. First our responsibility to the public whom we serve and secondly our responsibility to ourselves. Let me say, more particularly, for the benefit of those who are not of our profession, that medicine is not a monopoly or a close corporation as some would have you believe. The scientific principles upon which modern medicine stands have been discovered through the arduous toil of those master minds everywhere working to ascertain the truth of those laws and forces operating in the physical world, and all we ask of those who would join us is that they conform to the well-recognized standards of medical training. As we said before, the field is so great no one can hope to master it all, but we do believe the public has a right to expect that when a man or woman presumes to treat the sick, he should be as well qualified as it is humanly possible to be. We owe it to ourselves to be more united. The constant unrelenting toil of the general practitioner too often begets an isolation that renders him difficult of approach by his neighbouring confrère. We must develop more of the get-together spirit. Our local or county societies should be centres where men frequently gather for the discussion of medical problems and other matters pertaining to the health and activities of the community in which they live. Beyond this, a keener interest must be developed in the Provincial Association, so that in all questions of Public Health or Medical Legislation, the voice of our profession could be heard, as it has a right to be heard, for to whom if not to us, should our Legislatures turn for advice on these problems; but let me say as a warning, that conflict of opinion on our part will not get us very far, and while we seek thus to consolidate our interests in this province, let us not forget that we are only a part of the national organization. Through the Canadian Medical Association, we would seek by every means, to cement the ties that bind us to our colleagues in the other provinces. Let us forget the boundaries that may divide us and endeavour to build up in this new land, a profession, nation-wide in its compass, universal in its thought, and worthy in every way, of the best traditions of the great body to which we belong.

Current Medical Literature

THE LANCET, August 16th, 1919, Carlo Frankau, C.D.C., (D.S.O., F.R.C.S.), presents a case of carcinoma of the pelvic colon treated by resection and anastomosis, with no sign of recurrence after a period of six years.

A man, aged 47, was admitted to the hospital in July, 1913, for intestinal obstruction. The abdomen was opened by a mid-line incision. The intestinal tract presented a very greatly distended appearance, the caecum showing commencing splitting of the serous coat. Annular stricture completely closed off the pelvic colon just above the pelvic floor. With a view to removing the tumor a second muscle splitting incision was made over the caecum, but due to the great dissension, the caecum burst, necessitating the insertion of a Paul's tube and the return of the patient to the ward.

Some time later a second operation was done, the growth being removed and an end-to-end anastomosis of the colon being accomplished. The patient made a good recovery, all signs of obstruction being eliminated. Dr. Frankau reports having seen the man in May, 1919, enjoying very good health, with no intestinal disturbances. This case is particularly interesting from two points of view, namely, that the bursting of the caecum did not prove fatal, and secondly, that the carcinomous growth was successfully removed with apparent cure, a period of six years having elapsed since the operation.

W. E. Gallie, M.B., F.R.C.S., presents in this issue a very interesting case of the lengthening of an amputation stump, concluding with observations which throw very considerable light

Bronchial Affections Quinsy-Pharyngitis- Laryngitis, La Grippe

become more prevalent with the advent of cold weather, and the physician of wide experience recalls the important role *Antiphlogistine* plays in these diseases.

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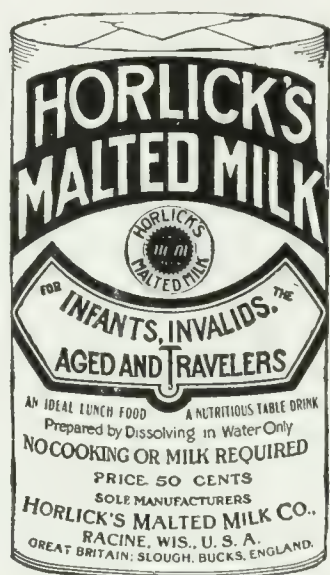
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upon this branch of orthopædic surgery. The medical profession and all others who have to deal with amputation cases, as well as the men themselves, are particularly cognizant of the many difficulties encountered in fitting a satisfactory artificial limb on a short stump. There is not the smallest doubt that many of these cases might be particularly benefited where the femur may be lengthened to give sufficient support to the artificial limb. It is hoped that the work done by Dr. Gallie may be only the commencement and that many other orthopædic surgeons may find it possible to repair amputation cases which will add very much to the comfort of the incapacitated soldier. The particular case presented by Dr. Gallie reads as follows:—

“Pte. B. was admitted to the Granville Canadian Special Hospital, Buxton, on April 15th, 1918, with amputation of the thigh at about junction of upper and middle thirds. The amputation had been performed with equal anterior and posterior flaps; wound had healed except in centre, where a discharging sinus led to dead bone. On May 3rd, 1918, operation for the osteomyelitis; the terminal inch of the femur was necrotic and had to be removed, thus the bone extended only two and a quarter inches below lesser trochanter. The flaps were sutured back in position; wound healed in two months. Patient was then fitted with a temporary artificial limb, but the femur was so short that when he flexed the hip the end of the bone slipped forward over the top of the socket. We were confronted with the necessity of fitting him with the tilting table leg or of lengthening the femur.

On Feb. 27th, 1919, he was operated upon again. The flaps were reflected as before and the incision continued up the outer side of the thigh as far as the great trochanter and deepened until the bone was exposed. The muscles were

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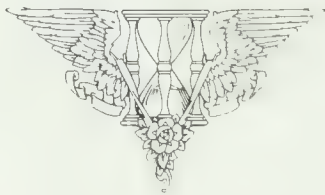
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then reflected until the outer half of the femur was laid bare. With an osteome applied in the sagittal plane a half of the terminal three and a half inches of the shaft of the bone was cut free. This piece of bone was slid downwards so as to lengthen the femur by two and a half inches, and was then fastened by two long screws of beef bone. The flaps were then dissected up sufficiently far to allow them to be drawn down and closed over the end of the bone. The wound healed by primary union, except for a hæmatoma, which opened spontaneously and disappeared without infection, otherwise recovery uneventful.

Two months later the fragments were solidly united and the patient commenced active exercise of the stump to increase the density of the bone. He is now wearing the ordinary artificial limb and has a very satisfactory stump."

In concluding, Dr. Gallie says:

"Among our wounded are many who could have such an operation done, for we have seen men passing through this hospital who had very short bones in their stumps and yet ample flaps of skin to allow bone lengthening. It has been the practice to remove these redundant flaps by re-amputation. Again, if a successful lengthening of the bone can be looked forward to, the method of primary amputation, when short bones are inevitable, should be changed. The skin flaps should be left very long, so that later sufficient skin will be available to cover the graft properly. This would also apply in civil practice."

**The first issue of this
Journal as a monthly will
be out in February, 1920.**

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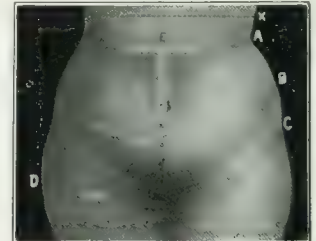
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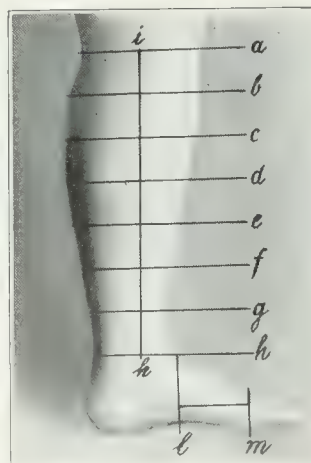


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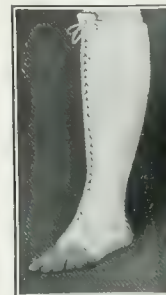
(See Folder, Page 27)

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Always give length I to K (K is below ankle) and circumference measurements at intervals of about 2 inches.

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Note — H circumference is below the ankle.



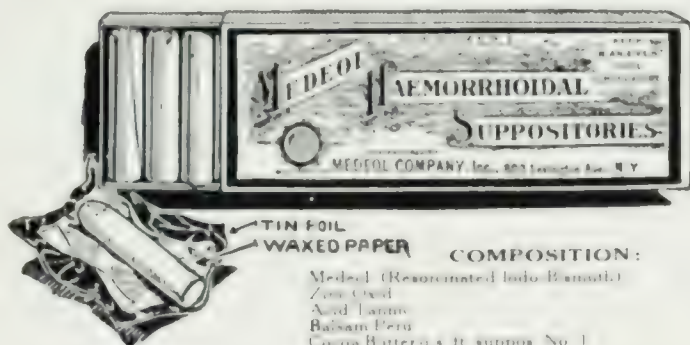
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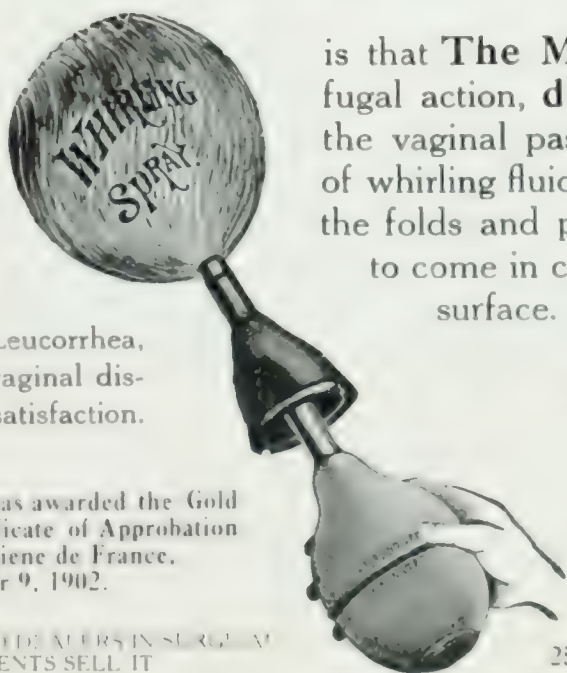
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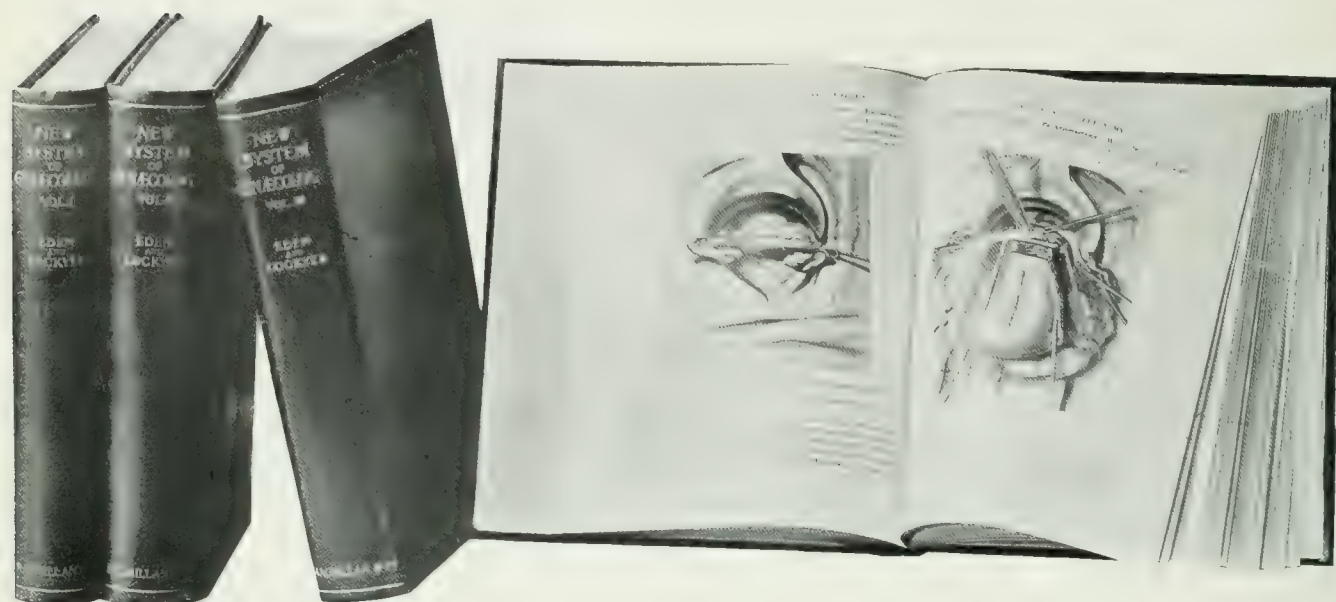


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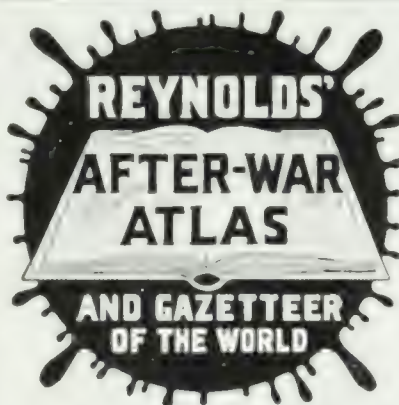
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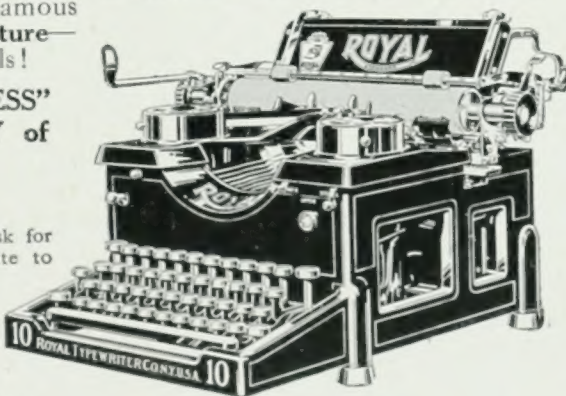
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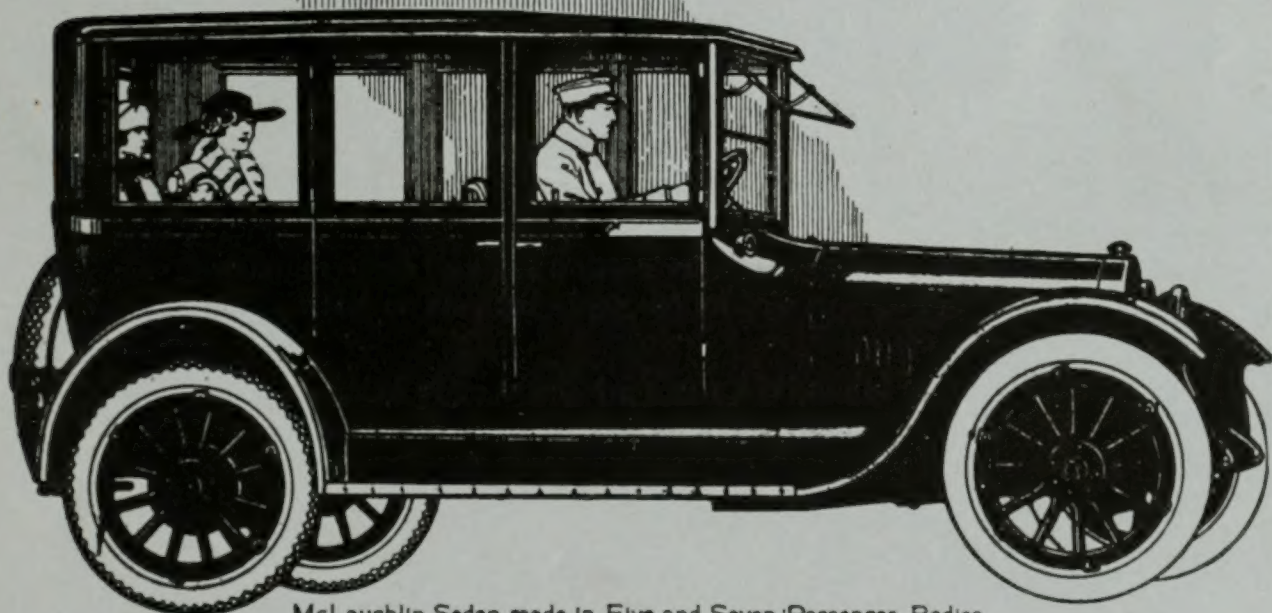


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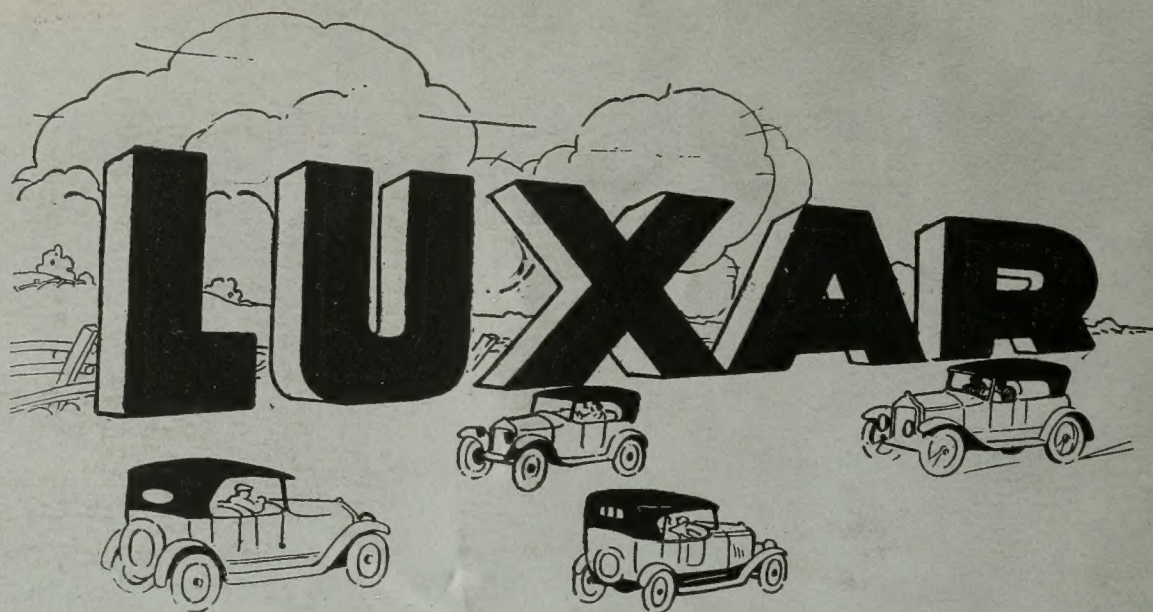
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